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THE CYANIDE PROCESS FOR WORKING SULPHURET ORES, Pages 3 to 12.

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MINING AND SCIENTIFIC PRESS.

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The MacArthur Metallurgical Filter.

The metallurgical filter patented by John S. MacArthur in this country Dec. 24, 1889, is intended for precipitating and separating precious metals from solutions containing them, such, for instance, as chlorides, bromides, theosulphates (sometimes called "hyposulphites"), or sulphates obtained in the well-known Plattner, Von Patera, Russell, Ziervogel and Augustine extracting processes.

The object of the invention is to provide a filter having a large active surface for the metals in solution.

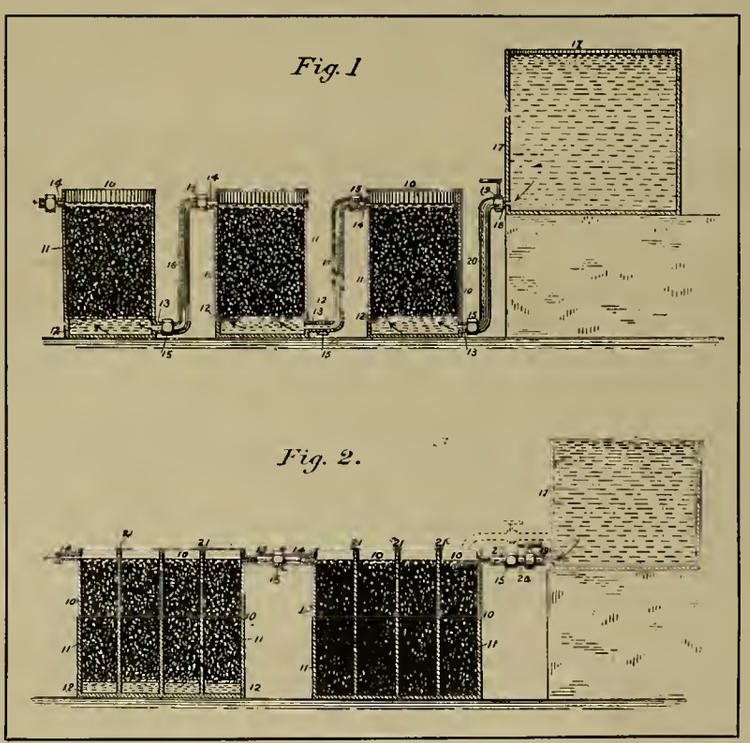
In the accompanying drawings, Fig. 1 is a sectional elevation of a series of these improved filters. Fig. 2 is a longitudinal vertical section of a filtering apparatus comprising two of these improved filters constructed in modified form. The zinc filiform sponge constitutes the principal feature of this improved filter.

Similar numerals of reference indicate corresponding parts in the different figures. This improved filter comprises a containing vessel, 10, and a zinc sponge, 11, disposed therein. The zinc sponge is preferably supported on a perforated false bottom, 12, disposed within said vessel near the bottom proper thereof. The vessel is provided with an inlet tube, 13, and an outlet tube, 14, the inlet tube being preferably disposed near the bottom of the vessel and the outlet tube near the top thereof, each of said tubes being provided with a coupling-nut, 15, when the vessels are used in series.

A number of these filters is preferably arranged in series, as represented in Fig. 1, from six to ten being ordinarily employed. When so arranged, the filters are connected by pipes ,16, which extend from the outlet near the top of one vessel to the inlet near the bottom of the adjacent vessel. A reservoir or tank, 17, for containing the solution holding the precious metals is disposed adjacent to the first filter of the series and elevated a sufficient distance to secure a proper flow of the liquid through the filters. This tank is provided with an outlet tube, 18, near its bottom, said tube being provided with a stopcock, 19, and connected by pipe, 20, with the inlet tube of the first filter of the series.

The zinc sponge, which constitutes the filtering material and precipitant, is preferably composed of fine threads or filaments of zinc interlocked together. The zinc threads from which the sponge is formed are cut by a turning tool from a series of zinc disks held between lathe centers and turned; or the zinc sponge may be formed by passing molten zinc, at a temperature just above the melting-point, through a fine sieve and allowing it to fall into water. This improved zinc sponge presents a very large contact surface for the action of the solution, and it does not become easily choked. Each containing vessel may be provided with a vertical partition or partitions, 21, as illustrated in Fig. 2, whereby the vessel is divided into two or more compartments or filtering chambers. These partitions extend to a point near the bottom or top of the vessel, as the case may be, or they are provided with holes near the top or near the bottom of the vessel. In case the vessel has three or more filtering chambers, the partitions are provided with communicating openings, disposed alternately near the bottom and top of the vessel, whereby the passage of the solution is downward through one of the filtering chambers, upward through the adjoining filtering chamber and downward again through the third filtering chamber, and so on.

In the use of this improved filtering apparatus the solution containing the precious metal is placed in tank 17, and the cock 19 is opened. In case a series of separate filters is employed, as represented in Fig. 1, the solution passes from the tank through the pipe 20 and into the first filter of the series, near the bottom thereof, beneath the false bottom 12, thence upward through the zinc sponge within the filter, thence outward near the top of the first filter, thence through the connecting-pipe to the next filter of the series, where it again enters near the bottom and passes upward through the zinc sponge to the top of the second filter of the series, and so on. The metal which is not precipitated by the first filter, is caught in the zinc sponge of the succeeding filters of the series.



MAC ARTHUR'S FILTER WITH ZINC SPONGE.

In case filters having a number of compartments are employed, the solution is preferably admitted to the first compartment at the top thereof, and passes down through the zinc sponge contained in said compartment to near the bottom thereof, and thence passes into the second compartment and upward through the zinc sponge therein contained, to near the top of said compartment, and thence downward through the next compartment, and so on through the several compartments of the compound filter, and thence to the next compound filter of the series, and through its several compartments. The precious metal may be separated from the zinc sponge by distillation, or the zinc sponge containing the precious metal may be placed in a suitable sieve and subjected to a screening operation, preferably under water. In this operation the greater part of the precious metal will pass through the sieve, and the greater part of the zinc sponge will remain therein.

Solvent Processes.

Solvent processes for working gold ores, such as those of Plattner, Mears, Newberry & Vautin, Pollok, Rothwell, Thiess, MacArthur-Forrest, and others, depend for their success on certain methods of dissolving and obtaining the gold in solution and precipitating it from the solution. There are a number of chemical substances which dissolve gold, and there are others which convert it into a soluble salt.

The ordinary mechanical methods of collecting gold from sands, gravel or rock have been carried on for ages, changing slightly as to appliances, but all based on the same general principle. Early in this century the metallurgists began to search for other methods of treating complex gold ores, though with but little success. But about 40 years ago, for the first time, it was proposed to treat these ores in a way similar to that carried on by natural forces, in dissolving and then depositing the gold.

There are many patents covering these solvent processes. A complete list of these is given in O'Driscoll's work on "Treatment of Gold Ores;" and in that he says: "Very little of the researches of the past generation are generally known by the present; in fact, even those who are supposed to have this knowledge possess little information on the subject; this is the only inference which can be drawn from the records of the solvent processes patented during the past 40 years."

The first one in this list compiled by O'Driscoll, is the patent of Prince Pierre Bagration, in 1843, who appears to have been the first to have used cyanide of potassium as a process for dissolving gold. He refers to the older methods of Elkinton (London), who used a double cyanide of potassium and iron as a dissolving medium, and Jacobi, who used ferrous cyanide for the same purpose. Among the last patents mentioned is that of MacArthur-Forrest, 1887. After looking over this long list of solvent processes, with their complicated patent claims, etc., the question is how have they progressed, and where are they practically applied. Mr. O'Driscoll answers this by saying that out of the long list, only two methods are in use to-day. One of these is the Plattner chlorination process so fully described by Kustel, and the other the Newberry-Vautin. To this may be added the MacArthur-Forrest.

It seems strange, however, that if these cyanide and other solvent processes were so well-known for so long, that they were not in use. Few are mentioned in the standard works on metallurgy in any detail. Either most of them must have been failures or mere laboratory experiments.

In fact, very few even of the accomplished metallurgists knew much about the use of cyanide for treating gold ores in a process. They knew of it as a solvent for gold, and knew of zinc for use by photographers in throwing gold down. But as to using these things on a large scale for working ores, no one seems to have done it until within the past few years. Either the methods adopted failed, or the matter was neglected. At all events, it has remained for the MacArthur-Forrest people to bring the system to the front in a practical way.

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SAN FRANCISCO, SATURDAY, JULY 2, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

MacArthur-Forrest Process—The Gold and Silver Extraction Mining and Milling Co., Denver, Colorado.
Gas or Gasoline Engines—The Union Gas Engine Co.
Dividend Notice—Pacific Coast Borax Co.

☞ *See Advertising Columns.*

Mining Machinery Models.

It is the intention of the Patent Office to make, at the World's Columbian Exposition at Chicago in 1893, an exhibit which will show that great advance in the several arts which is due, in large measure, to the encouragement and support afforded by our patent system. This exhibit is to consist of models of patented inventions, which will be carefully selected, to show as far as possible the inception of each art, the stages through which the art has advanced, and the final development reached at the present time. This display of typical inventions embodied in concrete form and properly arranged will, it is believed, constitute a grand historical exhibit of the progress of the useful arts, and one which will be of great interest not only to inventors and manufacturers, but to the public generally. The Patent Office is not in possession of the models of many valuable inventions which might be included in the proposed exhibit, and inventors and manufacturers are asked to assist it by loans of models already built.

Circulars are being sent to this coast and elsewhere asking for models of stamp-mill plants, concentrators, concentrator belts, amalgamators, pans, settlers, ore crushers, etc. This will be a good way to give an exhibit of our progress in the construction of mining machinery. A great many of the mechanical appliances of mining and metallurgy originated in California and Nevada, especially in connection with the milling of ores, and our manufacturers and inventors will do well to make some preparation toward exhibiting their things.

Models should be constructed of metal or hard wood, or both, and should be strongly made in order to withstand handling in transportation. They should be well proportioned and as small as will properly show the machine or device. If a machine, the model should, where practicable, not occupy more than one square foot of shelf space, and should not be more than 20 inches in height. In no case should models be more than 24 inches by 18 inches at the base by 20 inches in height unless by special arrangement.

Models should be neatly made and well finished. Parts constructed of wood should be stained, grained or polished, and parts constructed of metal should be, where not painted, well polished.

Labels placed on exhibits will set forth the general nature of the invention, name of the inventor, under what patent manufactured, by whom the model is loaned, capacity of the machine, and, when desired, where in the Exposition a working machine may be seen. It is, therefore, requested that these facts, where pertinent, be stated in the letters of transmittal.

Others May Get the Gold.

Sacramento county, through its attorney Robt. T. Devlin, has served injunctions on two more mines operating at Gold Run, for permitting debris to run into the river. The men who have been running these mines, in the face of the agreement made by the Miners' Association, will get no sympathy or support from the association or the mining community.

But these isolated instances of bad faith afford no good reason for the determined opposition of certain valley men to debris dams, the Caminetti bill or anything else which will permit mining. They do not want to see hydraulic mining start again in any way, and are going to hold a convention in August to air their grievances and bring public opinion back into their direction.

It has been most unfortunate for the miners' cause at this critical period that certain individuals have continued illicit mining when they should not have done so. It has aroused the opponents of mining and given them an excuse to renew the old hostilities.

The miners generally never had, and do not have now, any hope of again starting up mining without first providing means for impounding their debris. But just as they are on the point of getting legal permission to build the structures necessary for this purpose, the opposition to the structures and to the mines takes shape and jeopardizes the whole thing.

The only difference will be that future generations will get the gold from the hills instead of the people now living. When those with the intense prejudices now existing have gone the way of all flesh, the sounder judgment of younger men will find a way to reconcile the apparent differences. They will then build the dams talked of now, get the millions out of the hills, and think what fools they were who left it for them. There is little doubt but that this will happen. It will take years for the prejudices to pass away, perhaps, but that gold will not always be left where it is known to be. People can raise crops of all kinds in the various States in the Union, but there is only one great known storehouse of gold and that is in the red hills of California.

Mexican Ores.

The steamer Signal brought to this city this week 550 tons of rich silver and lead ore from the Topia mines, Sinaloa, Mexico, to be worked at the Selby smelting works. This is the first of a series of monthly shipments of ore from these mines. Previously, all ore from the Topia district, which takes in 15 mines, went by rail to the Denver smelters. Diverting the ore to this place means the changing of just so much business from points east, and placing it in the hands of the merchants of this city. Over 1000 people are employed in and around the mines, and their orders in this case go where the ore does. The Gurney Mining and Milling Company of Culiacan, Mexico, have made a contract for the delivery at this port of from 500 to 1000 tons monthly of silver and lead ores.

A business man of this city who is interested in mines in Mexico said, regarding large quantities of ore being brought here to be worked, that this move of establishing a monthly ore steamer line meant a great deal for San Francisco, and that the Topia district trade, if it all came to this city, was worth from $50,000 to $100,000 annually to our merchants.

This is a very important matter, indeed, for our local smelting works and our city. The Selby Company is now in a position to handle satisfactorily large quantities of ore, and is to be congratulated on having the opportunity to get these Mexican ores.

The Mining Congress.

At Helena preparations are being made to receive the delegates to the National Mining Congress, which convenes there on July 12th. No pains or money will be spared to make the convention a success. The delegates will be handsomely entertained while there, and a special will take them to Butte, where a day will be spent in inspecting the mines. The drilling contest, in which eight prizes will be given to double and single-handed drillers, will be an interesting feature of the meeting. A trip will also be made to Great Falls to see the reduction works there, and Anaconda will also be visited.

Doubtless much of the time of the convention will be occupied with the silver question, as that was the case last year at Denver. There are some new phases to the subject now, however, especially the attitude of the great political parties as expressed in their platforms. The utterances are not at all agreeable to the silver men, since neither party was outspoken in favor of the white metal.

There are other matters, however, which will be discussed at Helena, which will interest miners all over the country. A number of delegates from California will leave on the 7th and 8th of July, and arrangements have been made with the railroads for half-fare to Helena and return.

The Silver Party of Nevada.

The Nevada people, like others in other mining States, show a decided intention of switching off from the old parties, considering that the subject of free silver coinage is paramount to all others. At Reno, last week, a convention was held, at which Hon. Thomas Wren of Eureka was temporary chairman. He spoke at some length, giving the history of silver since the Legislature of 1873 to the present time. His remarks were frequently interrupted by applause. He advised the people of Nevada to stand firm for silver, and shake off the shackles of the two old parties. Then committees on credentials, permanent organization, platform and order of business were appointed on the basis of two delegates from each county in the State. The convention then took a recess until 3 P. M.

The convention was called to order at 3:30 P. M., when O. C. Powning of Reno was elected permanent chairman. The committee on credentials reported that of 10 counties represented there were 198 delegates present. The committee also advised that no party not belonging to the Silver League have any voice in the convention. The committee on platform then read the following report:

The citizens of Nevada, representatives of the various silver leagues, irrespective of past party affiliations, in convention assembled, do set forth the following declaration of principles: First—We demand of Congress the full remonetization of silver and the free and unlimited coinage thereof at the present ratio of sixteen to one. Second—We are radically and unalterably opposed to the national Republican and Democratic parties on the question of the free coinage of silver, and we denounce the action of their recent national conventions as inimical to the material interests of the people of the United States, and especially to those of Nevada and all the other mining States and Territories; and we hereby repudiate the nominees of their conventions. Third—We pledge the nominees of this convention for Presidential Electors to support no man for President or Vice-President of the United States who is not unqualifiedly in favor of free coinage as defined by this convention. We refer to the Silver League of Nevada, now assembled, the right of directing said Presidential Electors for whom to cast their votes should contingency require.

A. S. FITZGERALD, Chairman.
B. F. CUSTER, Secretary of Committee.

Dr. Bergstein then moved that the party be known as the Silver party of Nevada. Carried. Three Presidential Electors were then selected, namely, Hon. Thomas Wren, Eureka; Hon. M. S. Bonifield, Humboldt; O. C. Powning, Washoe. Alternates—George Nixon, editor *Silver State;* Hon. George Brown of Storey county; Hon. J. W. Westfield, Lyon county. Twelve delegates to the Omaha convention were then selected.

Testing on Silver Ores.

HOT CREEK, NYE COUNTY, June 18 1892.

TO THE EDITOR:—I have been testing the MacArthur-Forrest process in a small way on the silver ores of this district and from a chemical point of view it is very satisfactory. I get from 85-100 to 95-100 from ores that do not amalgamate, raw, to any good percentage.

There is a question in silver ores which is of greater importance than the same question as regards gold, viz., quantity of cyanide used up.

In theory 32.6 pounds of zinc will precipitate 197 pounds of gold, or 108 pounds of silver, also in theory, according to ors writer in the PRESS a few weeks ago, it takes two equivalents of cyanide of potassium or 118.1 pounds of cyanide of potassium to hold 326 pounds of zinc in solution, hence the question, can the zinc be *cheaply* precipitated and the solvent be restored to use, or must we lose, say one pound of the cyanide of potassium for every pound of silver gained and one-third of a pound of zinc.

Although silver minerals will dissolve in cyanide of potassium, I do not think metallic silver will. For the last week I have had a small silver assay button, one-tenth of a grain, in the same kind of solution I used to test the above-mentioned ones, and the cyanide of potassium solution does not seem to affect it. It may not be small enough—the button.

I would like to draw out information from others better qualified to give it. Many silver ores carry certain amounts of metallic silver. R. G.

ANDREW FRASER, the well-known mechanical and mining engineer, for many years connected with the Risdon Iron Works of this city, has been murdered in Mexico, probably by his guide, while on a business trip to the Jesus Maria mines. He left Chihuahua on May 30th for the mines, and about 100 miles of the journey had to be made on horseback. It is thought that on his return he started with no one but the treacherous guide. Answers to telegrams sent by the Risdon Co. confirm the sad news. The body of the dead engineer was found buried in an isolated spot, and on being disinterred was positively identified. The guide has not been captured yet, but under the urgent orders of the Risdon people the best officers in Mexico are in pursuit of the murderer, and his capture is believed to be certain. The Mexican authorities have not yet consented to the removal of the body to this country. It is supposed that the motive of the murder was robbery.

Mr. Fraser was a thoroughly competent man and one well liked by his associates and those with whom he came in contact. He had special knowledge in mining and metallurgical machinery, and was the writer of the new circular on these subjects lately issued by the Risdon works.

JOHN M. ADAMS, of the firm of Adams & Carter, died last week while on a fishing trip up on the Klamath reservation in Southern Oregon. The body was brought back and the funeral took place in this city on Wednesday. Mr. Adams, as agent of the Frue concentrator, was well known to mining men all over this coast, most parts of which he had visited. He was a most enthusiastic and skillful angler and passed what leisure time he could in enjoying that sport. He was a man who had many friends, as he was of a social, genial disposition, good-natured and obliging. Everybody who knew Mr. Adams spoke well of him.

THE CYANIDE PROCESS.

A Method of Working Gold and Silver Ores Without Amalgamation.

THE MacARTHUR-FORREST SYSTEM OF TREATING ORES.

RESULTS OF TESTS AND EXPERIENCE ON GOLD ORES IN CALIFORNIA AND ELSEWHERE.

The Opinions of Mr. Paul and Mr. Aaron—Tests by Louis Janin, Wm. D. Johnston, Louis Blanding and Others—Mr. MacArthur's Description of the System—The Details of the Patents Granted—Working Gold-Ore Tailings in South Africa—Full Description of the Details of Operating the Process on Various Kinds of Ore.

The patented MacArthur-Forrest process originated in England, and the English metallurgists have had longer experience in the promotion of the process in other fields of operation, than tha Americans have had in thia country. The Gold and Silver Extraction Mining aud Milling Co., of Denver, Colo., introduced the process in this country, and put up extensive works whera practical working tests of ora are carried out. On the Board of Directors of this company are several Scotchmen, and a good many of tha shareholders reaide in Great Britain. Tha Denvar company controls the rights to the most important mining States and Territories of this country, and has organized subsidiary companies on certain desirable territory.

The first of these subsidiary companies was organized in Sbasta county, California, througb the exertions of Mr. A. B. Paul, and a plant has been erected at the Calumet mine. Mr. Paul describes, in this number of the MINING AND SCIENTIFIC PRESS, the results of some of the work accomplished by him in Shasta county. Before commencing work in this State, he visited the works at Denver and thoroughly tested the cyanide process on his Shasta county ores at tha laboratory and mill. The new mill of the Shasta Gold Extraction Co., in the same county, is also under Mr. Paul's management.

The Comstock Gold and Silver Recovery Co. is another of the subsidiary organizations. They will erect mills and purchase ore and tailings on the Comstock. Tbis field comprises Lyon, Storay and Ormsby counties, Nevada.

The California and Nevada Gold and Silvar Extraction Co., organized last March, covers the field of Esmeralda and Douglas counties, Nev., and Mono and Inyo counties in this State. Thera ara several old and important camps in these counties the ores of which have not been profitably worked, hut which can ba treated to a handsome profit on the new system.

In Arizona companies have been organized in both Maricopa and Yavapai counties. Three mills have been equipped in tha former county. In Utah the experience of the Marcur Mill is printed in this issue of tha PRESS and other companies are preparing to use the process. In Montana and Idaho tha system has been tried and arrangemants ara being made to put up several plants. In Colorado several mills are operating on the MacArthur-Forrest system. In the Black Hills district of South Dakota a plant has been erected, with steel tanks instead of wooden ones.

A number of contracts have also been made with individuals in Calaveras, Nevada, Eldorado, Amador and Los Angeles counties in this State, and in other Pacific coast regions.

The cyanide process is a system by which the ore, after being crushed by stamps or other appliances, is treated in tanks or vats with a solution of cyanide of potassium, by which the gold is dissolved. The solution carrying the gold obtained from tha ora is then passed through boxes or filters containing zinc and the gold precipitatad. Tha cyanide solution is then returned to a receptacle for repeatad use.

This in brief is the process now attracting so much attention among mining men. The great value of the process lies in the fact that the sulphurets are treated without saparation from the ore, at the same time, thus saving the usually subsequent operations of concentration, roasting and chlorination. All that is requirad for a plant is the crushing appliances and suitable outfit of tanks, boxes or tubs for the solution.

There are so many thousands of mines, the ores of which carry sulphurets which will not pay hy the chlorination process, when all the otber expenses are considered, that it did not take very long for the cyanide process to attract attention wben onca brongbt to public notice by practical tests on a good scale.

That cyanide of potassium would dissolve gold has long been very well known. In most standard chemistries, cyanide is mentioned for such a purpose; its properties are understood, and it is in daily nse as a gold solvent in certain arts. But ita practical applicability to matallurgical operations on a large scale has not been shown until very lately.

Whatever may be the merits of the controversy on the subject of pateut rights in connection with tbis process or system, there is no doubt of one thing, which is tbat the MacArthur-Forrest patentees deserve tbe credit of first introducing and practically applying, on a large scale, the cyanide process for working ores. As long ago as 1843, a patent was obtained for dissolving gold by cyanida of potassium under a certain process, and in that patent tbe inventor refers to previous patents in the sama line. And in tbis country, Jarome W. Simpson of New Jersey patented a process in 1885 which included the use of cyanide and another substance for dissolving precious metals from ores.

Tbis patent antedates the MacArthur-Forrest patent in this country, but is not exactly the same in description or claims. We have reproduced. from tbe official volumes of the patent office, the specifications of these patents, that metallurgists may know the exact wording of descriptions and claims.

It is not our purpose to enter into any discussions of the relative merits or valua of the patents, that being a matter which, in case ot conflict would have to be determined by judicial inquiry. That which intarests our raadera mora is the results obtained by the systam in itself, no matter wbo owns the patents. Tha original company in Great Britain sold its rights in this country of the MacArthur-Forrest patent to the Gold and Silver Extraction Mining and Milling Company, with headquarters at Denver, Colo., and this company has introduced the system, made tests, and sells the right to use its patents. What thesa patents are is shown elsewhare.

The miners of this country, with sulphuret ores of low grade, have long been on the lookout for a method which would displace that of chlorination. Not hut that chlorination returns a high percentage and is satisfactory from a metallurgical point of view. But it is too expensive for low grade ores. This cyanide process can, under certain circumstances, displace it, and permit the working of ores of a lower grade than those adapted for chlorination.

The cyanide process is not a universal panacea, but works with certain classes of ores, and those classas of ores are the most abundant in this State and elsewhere. Where there are certain metals present it does not do well. But in most instances it appears to accomplish the object at a less cost than the processes previously in vogue.

During the past few months the MINING AND SCIENTIFIC PRESS has publishad more or less news concerning the working of this process. The result has been that we are in receipt of hundreds of latters from all parts of the country asking for further information. This shows the great interest which has been aroused in the system, and it is for that reason that wa publish this week an extra number devoted almost entiraly to consideration of the cyanide process. It was our intention to print in one number all that might interest the miner or millman on this subject, and it is hoped this is accomplished to the satisfaction of the readers.

Of course we understand very well that new processes come to the front occasionally which in a few years or months disappear from sight; and we understand, too, that many of them are founded on laboratory experiments, the promises of which are not always borne out by subsequant experience on a large scale.

But it must be confessed in this instance that the process has gone far beyond a laboratory experiment, and in one case, at least, works capable of treating 75,000 tons a yaar are in operation, which last year yielded from tailings nearly 20,000 ounces of gold. And this at a mine which is one of the best equipped for treating ora in the world. Any process which can show such a result would be worthy of investigation by miners elsewhere. But not only that, for there ara other works in operation in different parts of the country naarer at home, the managers of which all speak favorably of the system as worked by them. Again, well-known metallurgists who have investigated tha process, endorse it for certain classes of oras, and these classes, as stated, ara those which we have most abundantly.

There are those who are inclined to belittla tha whole thing because it has long been known that cyanide was a solvent of gold. Others because thay know of previous patents and previous experiments in tha same general direction. But in no other case than the present was the process pushed to a successful introdnction on a large scale. Experiments were made, it is true, and the results published, but they attracted little attention. In other cases caveats wera filed but the possible patent never applied for. Still again whera patents were issued their owners did nothing toward practically introducing their systems.

Now, however, that a company has worked ths system to a successful issue and hrought it to general notica so that inquiry is aroused and tests and terms asked for, those who have dona nothing are inclined to "back-cap" tba process and throw doubt not only on the patents but tbe practicability of the process itsalf.

It is very certain, however, that if tbere were not some merit in the system, when properly applied, the failure would have been found out by this time. That there bave been failures is true, but as we have stated, tbe process is not adapted to all sorts of ores.

At all events, sufficient success has heen proven by those who have put the process to practical tests on a large scala to induce others to experiment also. If a man has ore to which it is not suited, it costs very little to find this out, and ha need put up no expensive works on any one's mere say so. He can take his ore and see the tests made himself, if he chooses, as others from this Stata have done, at Denver.

There is plenty of opportunity for investigation before taking any definite steps toward arranging a plant, and if one makes up his mind the process does not suit bim, he can keep on as he is doing now.

It has been our endeavor to bring together in this issue of the PRESS as much general and detailed information as is available on this subject. Most that is printed is from the pens of men well known in the metallurgical and mining world. Their names are given so that the writers may be known. This number of the MINING AND SCIENTIFIC PRESS will be useful not only for casual reading, but for raference at any tima.

THE EXPERIMENTS IN CALIFORNIA.

MIDDLE CREEK, Shasta Co, June 4, 1892.

TO THE EDITOR:—It heing generally known that the Calumet Company was the first to introduce the MacArthur-Forrest process into California, on any practical working scale, my time has heen considerahly taxed in answering letters from very many mining men, not only in California, hut elsewhere, all inquiring as to the practicahility of the process, etc., etc. Seeing so many are interested, I have concluded to write a description of it, giving data so many desire, and let you publish it.

To preface, the process was first promoted hy the Cassel Gold Extracting Company of Glasgow, Scotland; from there it was introduced into Australia, South Africa, New Zealand and the United States. The patents for this country are held hy the Gold & Silver Extracting, Mining & Milling Company of Denver, Coloradn, of which ex-Senator Tahor is president, and Colonel T. L. Wiswall, secretary. This company was formed some two years ago, but little progress was made, however, until within the past year, and since the Denver company completed their 15-ton mill and commenced working ores, which gave such unexpected and satisfactory returns, in the way of high per cent, that every investigator was filled with wonder, and saw the revolution likely to follow.

On my attention heing called to it, now one year ago, I at once started for Denver, and was allowed all the desired privileges for a close investigation. The more I investigated, the more merit the process presented, and I soon became convinced that it was worthy of more than a passing consideration; in fact, in my own mind, concluded to "sail in" and find out all ahout it, on practical working of our own ores. Returning to California, I commenced a series of experiments, agreeahle to instructions received in Denver from their leading chemist, and soon made hetter results on our ore than made in Denver. It now took no time to decide as to the propriety of introducing the process on a large scale in the Calumet mill, under my management, and where it is now doing satisfactory work and heing extended, and will be up to 100 tons a day.

It may he information to many to state that in South Africa 13 mills are now operating the process with great success, and that mills are already in operation in Colnrado, Utah, Montana, Dakota and California. At the Needles, in San Bernardino county, a 100-ton mill is in course of erection. Being among the first in this country to accept its merits, I fancy, hy this time, I know something ahout it, and hence presume to speak.

The MacArthur-Forrest process is the use nf a weak solution of cyanide of potassium. The strength of cyanide should be, as testing your ore will show, the proper per cent for extracting the highest per cent of the precious metals, say from one-half nf one per cent to one and one-half, then treating your ore for a given length of time with

this solution; time for treatment according to the character of your ore and metals; how much hase and what kind. To get at this correctly, a few tests are necessary; hut it is easily worked out. And here, it is proper to state, that time is more the factor of per cent than a high per cent of cyanide. You never want to use a high per cent, as this speedily attacks the base metals, while a lower per cent attacks the gold and not the hase, hence the lowest per cent you can use to get the gold, the hetter. We have made many tests on this point, and all clearly establish this fact. I have failed in per cent of extraction on some ore, and then hy a few experiments, gained high per cents from same. It is a process of study, but once you get time and per cent determined, then there is no failure in your extraction from that especial ore, no matter to what extent you may go. So true has this heen with our working, on a small and large scale, that taking any ore, from any mine, I would not hesitate to huild a 50-ton mill on a simple test of 50 pounds, if the per cent of extraction was satisfactory.

There are two modes of having action from the cyanide on the ore; one is hy agitation, and the other is by time and percolation.

Agitation of ore in the solution, more speedily dissolves the gold, at the same time it triturates the material, so as to make slums, and thus what is gained hy agitation you lose when filtering the solution. Revolving harrels, or settlers, as used at times in silver mills, make good agitators. The percolating plan is the use of large tanks, whereby the ore rests in the solution, and in time is percolated off into reservoirs. Agitators take attention and power; percolation, less attention and no power; hesides, agitated material must be discharged into filtering tanks and allowed time to draw off. At Calumet, we first used agitators as per instructions, hut after trying percolating, gave it the preference, and are now pushing for enlarged capacity on this plan. This mode of working is heing generally adopted in South Africa, presumedly hy Mr. MacArthur's instructions. From my S. A. correspondent, I learn they are now constructing all mills for this way of operating the process. The new mill of the Shasta Company is also changing to the percolating plan. The Mercur mill of Utah was the first, in this country, to start on the percolating plan, on a scale of 30 tons per day, and made a hig success from the very start. All percolated solution, whether from agitators or tanks, contain cyanide, gold and silver in solution; consequently, all vessels receiving the same should he perfectly tight, as you presumedly are handling valuahle liquid, and for this reason iron tanks are to he preferred to wooden. This percolated solution is now transferred to the precipitating hox, of size according to value of ore and quantity to be treated. The hox used at Calumet is 14 feet long, with 14 apartments. These hoxes have wire screens on the hottom, and are filled with zinc shavings four inches deep. The hoxes are so constructed, that the solution is made to pass through the hody of shavings, which precipitates the gold and silver in a dark, blackish powder. By this part of the process, a given part of the zinc is destroyed; hut this is of no particular moment, as the loss is hut trifling in dollars and cents. The Calumet Co. are soon going to change these wooden zinc hoxes for white iron-stone chinaware, as made by the Toronto Pottery Works, Toronto, Ohio. Wood ahsorhs too much gold and cyanide.

The process is very simple and easily worked, when you have your plant right, and start right on the per cent of cyanide and time for your especial ore. It wants, however, to he handled intelligently, and it requires something more than mechanical skill to operate it properly. It is a process where brains and knowledge do not come in competition with "influence" or muscle. As to reducing ore, it is as yet an unsettled question whether it is hest to crush wet or dry, all points heing considered. The majority of the mills are crushing their ore dry. The Calumet Co. has started out on a new lay, which I think will he the winniog one; to wit, crushing by stamps, and running the cyanide solution through the battery instead of water. In other words, crush your quartz in the solutioo; thus you combine agitation, percolation and expedition.

This, though a new deal, suits us, and thus far no disadvantages present themselves, that override the advantages gained. This plan has been in operation over four months, with no discouraging features, while several additions have materially improved the plan. Of course you have to keep pumping your solution hack, and running rouod. For dry reduction, the Shasta Co's mill uses pulverizing harrels. The advantage gained hy the use of harrels is, all the ore is of equal grain, and, as you do not require fine crushing for this process, hy uniform grain of ore you do faster percolating. Time, however, is the essence of per cent more than fine crushing. As to the cost of working the process, there is a good deal to know before this question can he correctly answered; to give some idea, will say from $2 to $5 per ton. You can extract the gold and a high per cent of silver from the great majority of ores. The question is as to time, and at what per cent of cyanide. There is a very erronenus idea as to the cost of cyanide, and it is well to now correct it. 98–99–100 per cent cyanide costs in New York 50 cents per pound, F. O. B., as all can be assured hy addressing the Roessler & Hasslacher Chemical Co., 73 Pine St., New York.

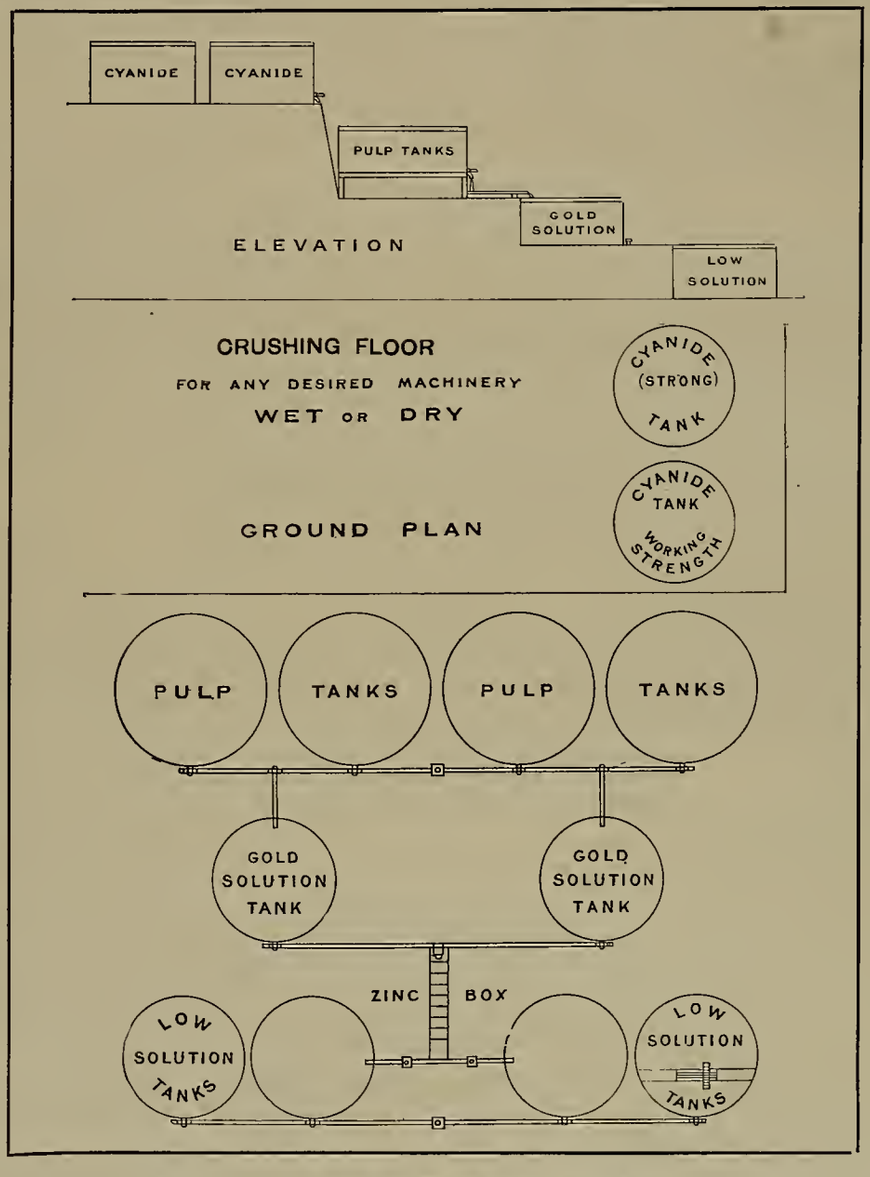
As to silver extraction, at first I paid no attention to it, but have found the process very efficient, except requiring more time than gold; yet silver is in so many combinations that testing should he the only guide for any especial ore. It will work readily all ores worked hy pan amalgamation. Taking California ores, from some it will often extract more silver than the total cost of milling. Yet it is not to be considered that every ore containing gold and silver can he profitahly treated hy this process. The most objectionahle ones are those containiog a goodly per cent of copper. As to cost of plant, for gold it is very much cheaper than the ordinary first-class mill; for silver, the expense will not he half the cost of pan mills.

To express myself as to the process will he to declare it one of the wonders of the times. I am aware that it has not the friendship of some men of science, who talk wisely on what they don't know. To me, all opposition is as a puff of wind in the face of every day demonstrated facts as I handle the process. I have heen cursed too often by disappointments in yields, hy our old systems, to not appreciate the fact of always heing sure of a high per cent of the value of the ore I treat.

One of the astonishing features of the process is, that you can take the heaviest sulphureted ores, and, without roasting, extract 95 per cent of the value out of the same, and then you cannot detect any perceptihle difference in their appearance. This was the hardest part for me to realize, hut I have long ago gotten over the douht, hut not the wonder.

One of the inviting features of the process is that all the machinery you want is for reducing your ore, and power to drive it; and what a comfort there is in this, every millman can realize. Then, coupled with the fact that your returns are certain, a wise man can grasp the future of mining. Thus I give the reader some idea of what the process is. Of course there is more or less detail, which can only be gained by practical manipulation of it.

ALMARIN B. PAUL,
Gen'l Man'g'r Calumet G. M. Co.



MR. PAUL'S CYANIDE PLANT IN SHASTA COUNTY, CAL.

At the request of the editor of the MINING AND SCIENTIFIC PRESS, Mr. A. B. Paul has made a sketch showing plan and elevation of plant for working ores by the MacArthur-Forrest process.

THE LIXIVIATION OF ORES WITH CYANIDE SOLUTIONS.

SAN FRANCISCO, June 25, 1892.
TO THE EDITOR:—I refer to that which is known as the MacArthur-Forrest process.

In the earlier working of this process the finely powdered ore was agitated, with the cyanide solution, in revolving harrels, or in pans, and, after a certain number of hours, was passed to a filter vat, drained and washed. This plan is generally giving place to simple percolation in filter vats which are made of sheet iron, or steel in some of the mills.

It is one of the advantages of the process that it admits of the use of iron vats, tanks, pipes, pumps, etc., hut hrass must he avoided. The iron vessels should he coated with a mixture of coal tar and asphalt, put on as hot as may be, not hecause the chemicals act directly on iron, hut hecause the iron will otherwise rust rapidly.

There seems to he no reason why wooden vats and and tanks should not he used, as, in fact they are in some mills; they also should receive a coat of tar and asphalt, inside at least, to prevent excessive ahsorption of the solution, or I think paraffin, well soaked into the wood hy means of heat, would he as much superior to tar in effect as it certainly would in appearance, hut it should he tested first to ascertain if it will permanently resist the solution, which no ordinary paint, white lead or lac varnish will.

An improvement introduced as to this process hy Mr. A. B. Paul, though long in use in silver lixiviation, is the discharge of the vats hy sluicing the sand out, through a gate, to a launder, in which a stream of water flows. Mr. Paul's gate is very simple, consisting of a cast iron frame, with suit-

able lugs for securing the closure, bolted to the side of the iron vat, from which a corresponding piece has been cut out. The closure is simply a piece of pine board with a gasket of blanket on the seat. The filters are like those used in the chlorination process, or in lixiviation of silver ores, hurlap on a perforated false bottom or a grating. The lixivium flows out from below the filter through an iron faucet, for which I think I should substitute a small nipple with a piece of soft rubber hose attached, into a launder, and so to a sump, whence it is drawn as required by an iron pipe to the precipitating boxes. The launders are sometimes made of boards nailed together, which is bad; they should be of sheet iron, tarred, or of wood pipe ripped in two and tarred inside; also they should be covered to exclude dust, etc. So far as the process is understood as yet, it would seem desirable to avoid unnecessary exposure of the solution to the air by allowing it to drip or flow from a height carrying air with it, into the liquid already in the receiving vessel, or to fall with a splash into a launder, etc.

Another good point in the process is that very coarse crushing answers for many ores, the extra time occupied by the extraction being fully compensated by the economy in crushing, and the saving of time in the draining and washing, owing to more rapid percolation. At the Calumet mill they crush wet through a 30-mesh screen, whereas much higher numbers were necessary for amalgamation; this, however, depends on the structure of the ore. If the metal to be extracted is diffused in grains through a compact gangue, fioe crushing is a necessity; but if it is in streaks, veinlets or seams, or if the gangue is very porous, coarse crushing even to the size of a pea may suffice.

When very fine crushing is required by the nature of the ore it may be best tn use the method of agitation in barrels, etc., but then the filter press should be employed to separate the liquid well and quickly from the pulp. In default of the filter press, filter vats and suction, either by fall or by pumping, may be resorted to. With ores which yield much slime, the coarser portion, or sand, may be separated and treated by percolation, and the slimes by agitation and the filter press.

The extraction of coarse gold by this process is not feasible. Where such gold occurs in conjunction with fine gold or auriferous sulphurets, I think it would answer to crush wet and amalgamate in the battery, passing the tailings into the percolators, which must be provided with overflow pipes or launders to conduct the excess of water to a sump whence it may be returned to the battery. If the ore is such as to require a preliminary treatment with lime or caustic soda, etc., these may well be put into the battery with the ore. Where such treatment is not required the cyanide may be put into the battery as is done at the Calumet mill; this may, however, slightly iocrease the deterioration of the cyanide by atmospheric action.

I believe Mr. A. B. Paul originated the method of putting the cyanide iotn the water used in the battery. He also added lime, but has given that up. I doubt if his ore requires lime or alkali, but I shall recur to the matter in the course of this article.

As to the means of crushing, it is with this as with all lixiviating or leaching processes, the more equal in size the particles are, the better, hence, those machines which give the best result in this respect are, other things being equal, the best for the purpose. Dry-crushing stamp batteries are notoriously defective in this regard, though there is an arrangement which I have described before, and which I cannot take time to describe here, by which the defect may be in a measure obviated. I think, however, that wet crushing will be generally adopted as it has much in its favor, and not a particle of ore need be lost where it is used. Where the quantity of slimes is not large, such portions as may still settle in the sump may be transferred periodically to a special vat aod treated at leisure.

It is not necessary to separate the sulphurets for special treatment, hence, in a case like that at Calumet, the manipulation is extremely simple. It is only necessary to crush the ore suitably, flow it into filter vats, allow the liquid to percolate for a sufficient length of time, and finally sluice the ore out of the vats. What though it may require four or six days to treat a charge? Vats can be made to contain 100 toos of ore and solution. At the works of the Robinson Gold Mining Co., Limited, in South Africa, they have recently increased their plant by the addition of 12 vats of 2000 cubic feet capacity each for the treatment of tailings. A set of vats properly cared for will last a lifetime, consuming nothing more than an occasional coat of tar. And there need be no hurry nor worry; if a workman or two should leave unexpectedly the work will not be at a standstill, for almost anything in the shape of a man, or even a woman, can do the work under proper direction, so little is skilled labor required. It is the most *comfortable* process to conduct that I know of, but a good assayer is required, and if he is also a fair chemist so much the better.

The precipitating box is a wooden trough about a foot wide and deep, closed at the ends and furoished with a cover. The length is, at Calumet, from 12 to 16 feet divided into about a dozen compartments by partitions which alternately extend to within an inch of the bottom and within several inches of the top. In each compartment is a tray or box with sides of wood, the lower edges furnished with sheet rubber gaskets tacked on; the bottom is a seive of iron wire with 8 or 10 meshes to the liuear inch. The upper part of the box fits snugly in the compartmeot, the sides being drawn in or tapered toward the bottom to facilitate removal by means of a bar of wood fixed across the top as a handle. The lower edge rests on a ledge or rabbet and by means of the rubber gasket makes a tolerably close joint. The solution passes alternately upward aud downward through the seives or trays, flowing over and under the respective partitions.

Zinc shavings are placed in the seives and upon them the precious metal is deposited. At suitable times the trays are removed, one by one, and shaken in a pan of water, when the precious metal, in the fnrm of a black powder, together with particles and shreds of zinc, pass through the seive. The tray is replenished with zinc shavings taken from another tray nearer the tail end of the trough, and replaced. Fresh zinc is charged into the last trays of the series, of which the contents have been transferred to the preceding trays. The reason for this is that the gold, etc., is deposited more rapidly on zinc that is already coated with gold than on clean zinc. The mixed gold, silver, and zinc in the pan is then sifted by a wire seive of 60 meshes to the linear inch to separate the coarser particles of zinc, these being placed on top of the shavings in the first tray. The precious metal is then washed, dried, and melted in sand-pots, with fluxes adapted to slagging off zinc, copper, if present, and other impurities. The liquid leaving the box retains a little dissolved gold which is not lost because the liquid is used again.

At Calumet the precipitating boxes are of naked lumber. I should think they would be better if well paraffined, or, perhaps, black varnish might answer. Mr. Paul is going to have trays of porcelaio, the advantage of which is not obvious to me. The entire apparatus might be of iron.

The zinc shavings are made at the Calumet mill from the cases in which the potassium cyanide is received, which are made of sheet zinc. The sheets are cut into discs of about six inches diameter, each with a hole in the center of about three-fourths inch diameter. The discs, to a number sufficient to make a cylinder or cheese about four inches thick, are placed on the iron spindle of a simple lathe driven by a belt, and are held firmly by being compressed between two discs of iron. As the spindle revolves, a cutter, just wide enough to take all the zinc discs while clearing the iron, is pressed against the cheese and takes off a thin shaving which consists of as many strips as there are sheets of zinc io the machine.

A statement which has excited some surprise is, that a sample taken from the upper stratum of the charge of ore in a vat, at any time during the progress of the lixiviation, correctly represents the entire charge as to its assay value. I think this is explained by the fact that the precious metal dissolves so slowly that the percolating liquid is never even approximately saturated; thus the action is practically equal throughout the mass, and there is at no time an appreciable difference between the upper and lower portions.

At Calumet, the lixivium is circulated; that is, the liquid which has passed through a charged vat is not passed at once to the precipitation, but pumped up and returned to the vat, being at the same time reinforced by an addition of cyanide so that it contains 0.60 per cent, the original strength having been 0.50 per cent as it went to the battery. Not solid cyanide, but stroog solution from a special vat, is used for the reinforcement. When the assay of a sample of the pulp shows a sufficiently close extraction, the liquid is allowed to subside to the surface of the ore, and is followed by a sufficient quantity of water, which is allowed to drain out and pass to the stock solution, compensating loss by evaporation, etc. I regret that I cannot at present give statistics as to cost of treatmeot and percentage of extraction. As I do not care to offer these at second hand, I must refer the reader to those who know all about them.

I now approach a difficult part of my subject. The cyanides have not received so much attention from chemists as have many other compounds; with special reference to the treatment of ores they have scarcely received any, hence the chemistry of the process is not very well understood by metallurgists; at least, very little that is of value can be found on this subject in the standard works. What I say must therefore be understood to be, to a great extent, only my present opinion, subject to correction as experience may afford more light, or as those who know more about the matter may come to the front. I will remark, however, that the subject is complex, and the chief use of theoretical considerations must, for a time, be to suggest, guide, and to some extent limit experiment which is the court of last resort.

It is an old story that solutions of certain cyanides can dissolve not only many metal compounds, such as silver oxide, chloride, etc., but also several of the metals themselves, in the metallic state, notably silver and gold. Attempts have been made, from time to time, to apply the cyanide solutions to the lixiviation of ores, but with little success unless recently. The keynote of the present process is the fact that extremely weak solutions, acting through considerable periods of time, give the most satisfactory results. The precipitation of gold and silver from the cyanides by means of zinc has long been used by photographers; it is in the specially advantageous form in which the zinc is applied that an advance has been made in this direction. Some attempts have been made at Denver to apply electrolysis to the recovery of the gold and silver extracted from the ore, and, although these attempts did not succeed, I think electrolysis will finally be adopted.

There seems to be a difference of opinion as to the chemical reaction by which metallic gold and silver are dissolved, some saying that access of air is essential while others deny that. I have not yet had ao opportunity to investigate this, which, however, I thing would not be very difficult, because if pure potassium cyanide in pure water can dissolve a metal, it would seem that hydrogen must be evolved and potassium hydroxide formed. Mr. Louis Janin, in an article published in the *Engineering and Mining Journal* of December 29, 1888, on *Cyanide of Potassium as a Lixiviating Agent for Silver Ores and Minerals*, expressed the belief that hydrogen was evolved from the surface of a piece of silver exposed to the action of a cyanide solution. The action is so very slow that it will require some time and patience to settle the question which may have a practical bearing.

There is also a want of agreement as to whether the gold in ores is ever in other than the metallic state, though it is generally conceded that true tellurides of gold exist. Mr. Henry G. Hanks however, has expressed the opinion, based on experiment, that the gold in the so-called tellurides is really metallic.

Be this as it may, the process seems to be able to extract the greater part of the gold from many ores, also the silver, though not so well, usually. By the use of weak solutions the extraction of base metals is reduced to a minimum; yet, as the copper sulphide is soluble in a solution of potassium cyanide, it results that some ores yield a portion of copper which is precipitated with the precious metals on the zinc. It is said that copper oxide also dissolves.

Ores which contain, or have contained, sulphurets which have become partly or wholly oxidized usually receive a preparatory treatmeot, the object of which is the decomposition of various metal-salts, the neutralization of acid or removal of certain oxides, as those of lead or zinc, which would otherwise decompose the cyanide solution or obstruct its action. This consists in subjecting the pulp to the action of lime-water, or of a solution of caustic alkali, by means of percolation, etc. In some cases carbonated alkali, as ley of wood ashes, would probably serve the purpose, though I have not yet heard of that being tried. The preparatory treatment sometimes occupies 36 hours or more, and in some instances costs more thao the extraction A private letter from Africa says that three months of experimenting were necessary in one mill to find a suitable method of preparing the material—tailings—for the extraction; unfortunately the cause of the difficulty, and the remedy, were not stated. "Practical men" may be interested in knowing that it was a *chemist* who fioally solved the problem. I suspect that some cases may require acid instead of alkaline washing, or perhaps acid first and alkaline following.

A disadvantage of limewater is the extremely slight solubility of lime; this might perhaps be remedied by mixing lime with the ore, either in wet or dry crushing, in more than sufficient quantity to saturate the water, then as fast as the dissolved lime should do its work a fresh quantity would dissolve, and so on; but if this were done, either the excess of lime must be completely washed out, or, results will follow on the application of the cyanide which, will be considered shortly. Hot limewater has been tried but did not answer so well as cold; probably the advantage of heat was counterbalanced by the diminished solubility of lime in hot water. As the presence of common salt increases the solubility of lime, I suggest a trial of it.

It has often been suggested that the caustic alkaline and cyanide solutions might be applied simultaneously, that is, the lime or caustic alkali might be added to the cyanide. This may answer in some cases and not in others, depending on whether the cyanide or the alkali, etc., would act most promptly on the deleterious substances. If base metal cyanides should be formed, which the alkali would not decompose, a loss of available cyanogeo would result,

and this loss would be greater in the case of the soluble metal-cyanides, such as those of zinc or copper, than with the insoluble ones, because a metal which forms a soluble compound not only decomposes an equivalent of potassium cyanide, but also combines with another equivalent, withdrawing that also from the field of utility. As to iron, it appears from the article by Mr. C. W. Merrill, republished in the *Press* of April 25th last, that ferrous cyanide is decomposed by caustic alkali, which means that the useful alkali cyanide is regenerated in that instance.

I have mentioned that in the Calumet Mill the cyanide is used in the wet crushing of the ore; until recently lime was also added, in pursuance of the idea of dispensing with a separate preparatory treatment. That the extraction was satisfactory does not prove that the principle is correct; it must first be shown that the ore needed such treatment, which I doubt.

But, granting that the ore did require something of the kind, let us see what would be the effects of putting lime into the battery with the cyanide solution. In the first place, it is very doubtful if the lime could perform its function instantaneously, except as to soluble sulphates of copper and iroo, not as to insoluble hasic salts which would be likely to exist and would yield but slowly to the action. Also, it will be readily admitted by chemists that the quantity of the lime could not be accurately adjusted to the requirement, hence an excess must he used; in fact five pounds of lime were added for each ton of ore.

Commercial cyanide contains a quantity of alkali carbooate, which caustic lime changes to caustic alkali with simultaneous production of insoluble calcium carbonate; so far then, we find we have caustic alkali to complete the work for which the lime was used, and it would be much the more efficacious, at least as to some substances. But the lime is added continually with the ore, while the sodium carbonate is only added at long intervals in the added cyanide, hence the lime is almost sure to be in excess of the sodium carbonate, at least temporarily, perhaps permanently. In working ten tons of ore per day, 50 lbs. of crude lime, equal probably to at least 25 lbs. of pure lime, were used; in the same length of time, 18.6 lbs. of cyanide of 70 per cent purity were used, which could not possibly have contained more than 5.58 lbs. of sodium carbonate, and certainly did contain less, because of other impurities; say it contained 4 lbs.; this would leave the lime largely in excess permanently. The next effect of the excess of lime would be, to decompose potassium cyanide, forming calcium cyanide, which may be just as good, and caustic potash. Thus we see that lime produces caustic alkali in the solution. What may be the effects of that?

At the Calumet mill, the results are not known to have been deleterious, and on the other hand, the abandonment of the use of lime had not, at last accounts, produced any bad effect, but the inventors of the process have cautioned operators against the presence of caustic in the cyanide, claiming that it does harm. With ores, like those of the Comstock, containing sulphantimonides, caustic alkali produces alkali sulphide, and it has been stated by some that alkali sulphide interferes with the precipitation of the gold. Caustic alkali will also dissolve the oxides and sulphates of lead if present, and many other substances the effects of which on this process I do not know. Thus, those who are waiting for Mr. Paul's results, in order to follow his example, should remember that what may suit his case may not suit theirs. One effect of caustic alkali must he to increase the consumption of zinc.

In whatever form the lime may exist in the solution, except a trifling quantity of sulphate, it will constantly fall out, wherever the liquid may flow or remain, as calcium carhonate, causing some inconvenience; and unless there is some special advantage in the use of lime it would seem hetter to use caustic alkali. This, it must be understood, applies only to the use of the lime in conjunction with the cyanide, as was done at Calumet; it has no bearing on the use of lime-water in preparatory treatment if the ore is washed before applying the cyanide.

I will now show how the presence of caustic alkali, whether produced hy means of lime or added as such, may be beneficial; also that it is prohahly impossible to work the process without producing at least a small quantity of caustic.

Carbon dioxide (carhonic acid gas) is always present in the atmosphere, and it has the property of displacing cyanogen from the alkali and alkaline earth cyanides, forming prussic acid which gradually evaporates. This causes the odor of potassium cyanide. But if caustic alkali is present it takes the carbon dioxide and is converted into alkali carhonate, prussic acid is not formed, and cyanogen is not lost; or, at least, if prussic acid is formed, it is instantly neutralized hy the caustic alkali, and an alkali cyanide is reproduced. These reactions may be thus expressed:

$$2\,KCN + CO_2 + H_2O = K_2CO_3 + 2\,HCN, \text{ and } 2\,HCN + 2\,KOH = 2\,KCN + 2\,H_2O.$$

If calcium is present as lime dissolved in the liquid, it will combine with the CO_2 whether caustic alkali is also present or not, formiog insoluble calcium carbonate; and if it is in the form of calcium cyanide, resulting from the action of lime, as before explained, it will still combine with CO_2, with or without evolution of HCN and consequent loss of C_2N_2, according to whether caustic alkali is present or not. Thus we see that caustic lime or caustic alkali in the liquid protects the cyanide from the decomposing action of atmospheric CO_2. As to caustic lime, however, that cannot probably be present until all the potassium cyanide has been decomposed while an excess of lime remains.

I have said it is probably impossible to work without the production of caustic. Whether or not the gold in dissolving produces caustic, as I think it must, it is a fact that hydrogen is evolved in the precipitation box, and that means that zinc dissolves, forming zinc cyanide and caustic potash (or lime, as the case may be; the lime would make caustic soda as soon as it should come in cootact with sodium carbonate from the impure cyanide added daily). I do not think that pure zinc can decompose pure potassium cyanide in solution, at least not rapidly, until some caustic has been formed, but as soon as iron or gold is placed in cootact with zinc in a cyanide solution, pure or not, a brisk evolution of hydrogen begins, and every chemist knows what that must imply. In the precipitating box the zinc is in contact with both gold and iron, the gold which is precipitated on it, and the iron sieve on which it rests. I saw the mass of zinc shavings actually lifted to the surface of the liquid by the floating effect of the hydrogen.

There are some interesting facts connected with the precipitation of metals from the cyanide solution. I examined some of the precipitate from the mill, which consisted of gold, silver, copper, calcium carbonate and other substances, including fine shreds of zinc. To my surprise the copper dissolved with effervescence in dilute hydrochloric acid, which proved that it was not in the metallic state; it also dissolved, at least partially, in dilute sulphuric acid. The gas evolved was without distinctive odor, and the solution by hydrochloric acid contained cuprous chloride, as shown by the formation of oxychloride in the neck of the funoel and on the surface of the liquid. I did not remain at the works long enough to investigate this matter, but Mr. T. E. Eichhaum, the chemist there, has sioce verified the facts and made further observations, not only in this regard, but also as to the precipitation of the precious metals.

Another circumstance which I observed, and which Mr. Eichbaum has also verified, is that zinc does not precipitate copper from a solution made with potassium cyanide of 98–99 per cent purity, nor does it cause evolution of gas. On adding metallic iron, in contact with the zinc, a brisk evolution of gas takes place, yet copper is not deposited. If, however, the solution of copper is made with the impure cyanide used in the mill, copper soon makes its appearance on the zinc. The latter fact is reported by Mr. Eichbaum, and I am not sure whether or not he found an addition of caustic necessary to the effect, which is important, because, though the mill cyanide certainly contaios carhonate, it does not seem to contain caustic.

The lixiviating solution is assayed daily for available cyanogen as represented by percentage of pure potassium cyanide. This is done hy means of a standard solution of neutral silver nitrate which is delivered, by means of a hurette, into a measured quantity of the liquid, to be tested. As soon as turhidity ensues in the liquid, the hurette is read, and a simple calculation shows the percentage strength in potassium cyanide, or its equivalent in sodium or calcium cyanide. Metal cyanides, or metal and potassium, etc., double cyanides which may be present, do not interfere; hence, the process does not show the entire quantity of cyanogen present, but only that which is in a useful condition, which is what the operator desires to know.

The rationale of the assay is, that while silver cyanide is insoluble in water, and in solutions of such suhstances as may he present in the liquid, other than free cyanide of potassium (solution or calcium), yet it is soluble in that, hence cannot form a precipitate until that is all disposed of; the quantity of silver nitrate consumed before a precipitate appears, is, therefore, the measure of the available cyanide present. The necessary reinforcement is made by adding a measured quantity of concentrated solution of cyanide, of known strength, to a known quantity of the stock solution in a tank.

What becomes of the zinc which continuallly goes into the solution? This question is often asked. I have a certain suspicion on this point, hut for the present will only say that the zinc does not appear to have caused any inconvenience thus far, though the solution has been used constantly for many months, it is said for a year, without other renewal than the daily addition of cyanide and water to make up for loss. Owing to this addition of water the stock solution can never become saturated with zinc, the accumulation of which cannot pass a certain maximum; the same is true of the alkali carbonate which, in the absence of lime, must be constantly forming.

The effects of these substances, as well as of others which may be in the crude cyanide used, and of yet others which may be added if desirable, will form an interesting study which may lead to a means of increasing the efficiency of the process, especially in the extraction of silver. There is also room for improvement in the form of precipitation of the precious metals, and for the exclusion of base metals and other impurities by which they are often contamioated.

It is said that zinc and copper may be removed from the solution, and alkali cyanide regenerated, by means of an alkali sulphide; this has been doubted, at least as to copper, because of the solubility of copper sulphide in solution of alkali cyanide. It may be that in the weak solution used, the copper sulphide may form and may endure long enough to enable its removal.

I must say I expect to hear of maoy disappointments as to this process, though but little harm need result if those who may think of adopting it will first have it thoroughly tested with regard to their particular ore. It should not be supposed that all ores of precious metal can be treated successfully in this way, nor that it will have the advantage of relative economy in all cases. There are instances in which gold quartz is mined and milled profitably on a yield of $3 per ton or even less, the cost of milling being often as low as 40 cents per ton; the lowest estimate I have seen of the cost of this process is $1.50 per ton, under favorable conditions, clearly then it must save at least $1.10 per ton more in such a case than common milling, or there must be a relative loss. It is of no use for enthusiasts to exclaim and protest that it will do this and more; it must be proved by trial in each particular case, at least until we shall know more about the subject than we do now.

Nevertheless, I think there is a wide field of usefulness for the process, even now, in the treatment of material, whether original ore, tailings, slimes, or concentrates, in which the gold exists in very fine particles. Some assert and others deny that the so-called tellurides yield to the process, and I have not heard of a satisfactory result from ores of which a large part of the value was silver, excepting some of Mr. Janin's results as reported by him in the article referred to above, and lately as to Comstock ores which have never been considered as refractory, and from their composition would seem likely to yield to this process.

This article is not written in the interest of Messrs. MacArthur and Forrest, nor in that of any of their representatives, but in response to a general demand for ioformation and opinions in regard to the treatment of ores by means of cyanide solutions, regardless of the claims of the alleged inventors or patentees, with which I do not occupy myself. Personally, I should prefer to see the metallurgical field untrammeled hy patents—unless I could get a good patent myself—though if this process had not been patented many who may use it would never have heard of it. Moreover, people are very apt to think that information or advice which costs nothing is worth just its price, that is nothing, and to disregard it accordingly, as I have had frequent occasion to observe.

Note.—In considering the effects of lime, I overlooked the circumstance that sodium carbonate and potassium cyanide in solution together will, wholly or partially, exchange constituents which, however, will not alter the ultimate effects.

It seems prohahle that there may he a formation of ammonium cyanide in the solution. Atmospheric oxygen ahsorbed hy the solution, produces, I think, not a cyanate as suggested by Mr. MacArthur, but potassium carbonate and ammonium carbonate; the latter prohably transfers carhon-dioxide to the alkali of the cyanide and forms ammonium cyanide.

So long as an ammonium salt is present, the electrochemical action in the precipitating box must produce, not caustic alkali, but caustic ammonia, a part of which must escape, entrained by the hydrogen, while another part takes up atmospheric CO , prohahly traosferring that to the alkali of a portion of the alkali cyanide, and returning to the state of ammonium cyanide; thus the latter salt may gradually accumulate in the stock solution.

I have made some experiments on a sample of auriferous pyrites which yield nearly all of the gold to seven hours treatment with a one per cent solution of potassium cyanide. My resul's indicate that the cyanides of potassium, sodium, and ammonium are equally efficient, molecule for molecule, and that, with such an ore at least, the presence of an alkali chloride has no marked influence.

C. H. AARON.

TIME A FACTOR OF SUCCESS.

SONORA, TUOLUMNE CO., June 20, 1892.

TO THE EDITOR:—In an article written hy myself regarding the cyanide gold prncess, and which appeared in your issue of the 11th June, I omitted to state a fact which I consider impoitant to those investigating the matter, and in view of the discussion now heing had regarding this process. *Facts* alone enahle us to reach logical cnnclusions. They are the premises in the inductive system of philosophy.

There is in this county a mine (the Pine Nut) whose ores are very hase and refractory—consisting of quartz and the sulphides of iron, copper, lead and zinc. The ore is heavily sulphureted, the zinc in nnusually large propnrtion. It contains gold and silver in good paying quantity.

I made two tests of this ore from the same sample, having selected it as the basest ore I could ohtain in tbe county. Now for the fact and results.

The first trial was made during *five* hours of contact of the ore with the solution, and the solution was passed through *zinc shavings*. Result, 82½ per cent gold and 61¾ per cent silver.

The second test on a portion of same sample, the contact of ore with solution heing *seven and one-half* hours, the solution was kept in motion in contact with several zinc plates, presenting large surfaces to the solution. Result, 92¼ per cent gold and 79½ per cent silver.

A short increase in time, with the zinc plates, gave a marked increase in yield. This is the fact I wish parties testing this process to note. My results show *time* to he an important factor of success. Yours truly,

LOUIS BLANDING.

STRENGTH OF THE SOLUTION.

GRANGEVILLE, IDAHO, June 25.

TO THE EDITOR:—In Mr. J. S. MacArthur's article, recently published in the PRESS, "The Cyanide System," it seems to me that he omited a very essential, in fact an ahsolutely necessary part of the process to he understood, and that is, the strength of his "cyanide solution" for practical and economical working. Toward tbe close of his article he says: "By the cyanide method one ton will treat 100 tons." I am very douhtful on that proposition, that a one per cent solution of cyanide of potassium will attack sulphide ores with any such activity as he claims. Further, how does he procure "threads of zinc," one pound of which occupies two gallons measure." I hope you will take these questions up in your valuahle paper. Yours very truly,

H. W. BUTLER.

THE MINING BUREAU'S INVESTIGATIONS.

SAN FRANCISCO, June 25, 1892.

TO THE EDITOR:—In your issue of May 21st "A Practical Miner" says in regard to the new cyanide process: "By the way, how is it the State Mining Bureau has not told us ahout this new process? If there's anytbing in the thing, as Paul and the rest of them pretend, I think the Bureau would know and would let us know all about it. That's what we keep it for, I guess."

In your issue of June 4th, Almarin B. Paul, in an answer to "A Practical Miner," says: "Ahout the only sensible feature I see in your correspondent's article is his query as to the Mining Bureau. The Mining Bureau is like too many scientific men; they want to wait until the process gets popular and everyhody is posted, then tbey will talk wisely."

Please do the Mining Bureau the justice to call attention to the fact that the "cyanide process" was investigated hy it in 1889, and that an article treating of the process was puhlished in the report for 1890 long hefore Almarin B. Paul had even heard of the process. In fact, if his own statements are worth anything, it was the Mining Bureau's report that induced him to take the trip to Denver to investigate the "cyanide process." Truly yours,

WM. D. JOHNSTON,
Chemist State Mining Bureau.

In the article referred to by Mr. Johnson in the above letter, he quotes a description of the MacArthur-Forrest process, written by Mr. Wm. Jonea, December 21, 1889, and then publiahes the following conclusiona in the report of the State Mining Bureau for 1890:

The claims set forth in the above article undoubtedly caused great surprise to the chemists as well as to the mining engineers of the civilized world. That cyanide of potassaium would dissolve metallic gold and silver, forming aoluble double cyanides of gold and silver, had long been known to chemiats and electroplaters, and the double cyanide of gold and potassium ianow the favorite aolution of gold used in gold-plating. That a dilute solution of cyanide of potassium would extract gold and silver from their combination in sulphureta of iron, etc., leaving the sulphurets apparently unchanged by this treatment, was certainly an amazing atatement, and justified to a great extent the incredulity with which chemists received the article, and the refusal of many of them to test the truth of the statement for their own satisfaction.

Tbe writer confesses to having shared in tbe doubts of the majority, and for a time looked upon the subject as a companion of the schemes attempted to be palmed off on our capitalists by Alfred Paraf, of oleomargarine fame; Major Tichenor, of Calistoga notoriety; Rohertson (alias potassium cyanide), of San Francisco; and tbe "green gold" swindlers of San Rafael.

Tbe "Paraf" scheme consisted in the discovery of tin ore on the Potrero, adjoining the city of San Francisco on the south. In 1875 he had some of the newly-made "Bonanza Kings of the Comstock" in a high state of joyful mental excitement; one of them was carrying in his vest pocket little buttons of tin that he had seen smelted from the Potrero rock by the cunning Paraf and his mysterious process. The regular chemists of tbe city, not being able to extract tin from the "Paraf tin stone," were for a time under a cloud. Paraf was finally cornered into smelting some of his ore in a chemist's laboratory, his secret of extraction being in the use of a liquid (which he called pure glycerine) as an ingredient in the fluxing.

Tbe experiment was tried in the presence of one of the "Bonanza Kings," but Mr. Paraf was not allowed to handle the fluxes and, to his chagrin, the addition of glycerine failed to produce a tin hutton. Paraf went to a well-known drug store and brought back a bottle labeled "pure glycerine" and wanted to try it over witb his liquid; the hottle was seized and the glycerine found to be a saturated aolution of chloride of tin. This explained very satisfactorily the source of the successful results in his assays, but at the same time prevented the transfer (to use a slang phrase current in this part of the world) of any of the capitalist's "tin" to Paraf's pocket.

Major Tichenor's wonderful discovery was that the water of the springs at Calistoga contained gold, in the form of "terchloride," and was readily precipitated by the addition of protosulphate of iron.

Notwithstanding the absurdity of this claim and its ready exposure by the State Mining Bureau almost in its infantile stage, numerous people, with more money than brains, readily purchased interests from the smooth-talking Major Ticbenor.

About 1880 Robertson entered the field with a wonderful discovery, which yielded results in Robertson's hands that caused people's eyes to open with astonishment and in some cases their purses, also.

His "process" was to beat the quartz in lumps in a muffle; then drop it while hot into a solution of cyanide of potassium; crush, grind and amalgamate it, when he invariahly found gold. The fact that he was manipulating rock that did not carry any gold that a fire assay could detect did not at all interfere with his obtaining very respectably sized lumps of amalgam, which upon retorting showed the yellow gold.

But that the gold was due to Robertson, and not to any special merit of his process, was shown by the fact that a manipulation of the rock carried out by the writer under Robertson's own instructions and personal supervision (except that Robertson was not allowed to get close enough to exercise any legerdemain) failed to yield any gold.

The "green gold" scheme of San Rafael, which depleted the purses of some of our citizens, who doubtless have often since smiled at tbeir credulity, consisted in the claim that a ledge in Marin county contained paying quantities of gold, but in a "green" state—that is, it was not yet fully matured into metallic gold, whicb maturity, however, certain parties, by a secret process, could bring about in short order.

This "green" or "youthful" gold had the unfortunate property of escaping detection by the ordinary assayer, hecause, as they asserted, of a lack of knowledge to flux it properly so as to render it "maiure," and, consequently, visible. One of the secrets of their fluxing that they were willing to give to the public was that the presence of traces even of common salt in the fluxing would cause this "green gold" to volatilize. This information spread so rapidly in the early part of the last decade that it was not at all uncommon for assayers to be requested by customera not to put any aalt in their cruciblea as a part of the fluxing.

The stock in this company found many purchasers; but it is needless to remark that the only "green" gold that ever matured was that portion that waa taken from the "green" investors' pockets.

In the first experiments on the MacArthur-Forrest procesa, made in the laboratory of the State Mining Bureau, the sulphurets treated with a 1 per cent aolution of cyanide of potassium only yielded 40 per cent of the assay value. Upon investigation the sulphurets were found to contain free gold, and after treatment with the cyanide solution free gold was found by carefully panning.

Thia induced us to make experiments as to the aolvent action of dilute cyanide upon metallic gold.

In all the experiments the actual percentage of cyanide of potassium in tbe salt used was determined, the percentage varying from 45 to 71 per cent, and sufficient of the commercial cyanide waa taken to make the actual cyanide present equivalent to 1 per cent.

With thia 1 per cent solution it was found that one hour was sufficient to dissolve gold leaf, such aa is used by aign writers. Reflecting, however, that gold in nature in the rock was very aeldom found in such an attenuated state, the experimenta were repeated on gold foil such as is used by dentists, being, as nearly as I could approximate by measuring and comparing by weight, about six timea as thick aa the gold leaf firat used.

The ahortest period of time in which gold foil of this thicknesa was dissolved was 48 hours. The deduction from these experimenta was that for the aolution of free gold in particles of an appreciable aize in a dilute cyanide solution, the new process waa not a success.

Our attention waa then directed to its action upon the gold contained in aulphureta. The sulphurets used in the experiments were typical of those worked by the chlorination works at Sutter Creek, Amador county, and contained five and one-tenth ounces of gold.

Taking the sulphurets iu the same condition as regar ds fineness of division as they are used in the chlorination process and digesting with 1 per cent cyanide, partly by percolation and partly by agitation, tbe following results were obtained:

After two hours' treatment tailings contained 35.29 per cent of the gold.
After three hours' treatment tailings contained 31.37 per cent of the gold.
After four hours' treatment tailings contained 30.37 per cent of the gold.
After six hours' treatment tailings contained 25.49 per cent of the gold.
After eight hours' treatment tailings contained 21.56 per cent of the gold.

The same sulphurets ground and passed through a "100" sieve after six hours' digestion, had left in the tailings 17.64 per cent of tbe gold.

To determine whether the dilute cyanide was capable of extracting all the gold present in these sulphurets, the following experiment was made: The ore was ground to an impalpahle powder in an agate mortar and digested for 48 hours with three different solutions of 1 per cent cyanide; the tailings were found to retain 9.80 per cent of the gold.

Another lot of sulphurets from wbicb the "free" gold had heen removed with extreme care were subjected to the following experiments: The ore was passed through a "120" sieve and digested witb a 1 per cent solution of cyanide of potassium.

After two hours' treatment tailings retained 31.2 per cent of gold.
After three hours' treatment tailings retained 28.5 per cent of gold.
After four hours' treatment tailings retained 15.6 per cent of gold.
After five hours' treatment tailings retained 15.5 per cent of gold.
After eight hours' treatment tailings retained 10.4 per cent of gold.

The "float slimes" from a $500 gold ore (tbe "slimes" assaying 5.3 ounces gold) treated for six hours with a 1 per cent solution of cyanide, yielded the best results of any of the experiments, the tailings retaining only 4.71 per cent of the gold.

In regard to the precipitation of the gold from its solution in cyanide of potassium by the aid of metallic zinc, experiments on the small scale in the laboratory appear to substantiate the claims made for this part of the MacArthur-Forrest process.

Tbe "MacArthur-Forrest" process must be regarded as a valuable addition to the metallurgy of gold and silver. Being yet in its infancy, and opening up as it does a new line of investigation and research, improvements may rationally be expected.

As noted above, the most marked success is attained when the ore is in an impalpable powder, and the precious metals in combination with the sulphurets.

From our experiments we feel convinced that in our next report we will be able to chronicle some very marked and valuable discoveries in this direction.

MR. MAC ARTHUR'S DESCRIPTION OF HIS SYSTEM OF GOLD EXTRACTION.

In order to understand the present systems of gold extraction, to properly appreciate the work already done, and to guage the difficulties to he surmounted, it is necessary for us to look back and trace the connection hetween the known forms of gold as found in nature and the methods used to separate it frcm its hase environments.

In the earliest ages gold would naturally only he found in nuggets and grains (our word caret is derived from a Persian word meaning a grain), which required no means of separation heyond picking up—happy age when gold had only to be picked up!

From grains the ancient would come down to gold dust, and this was no doubt separated from the sand or earthy matter with which it was associated, hy the skillful use of air currents which were caused to hlow away the sand, leaving the precious metallic dust. This method is still practiced in Arahia and the East. Wherever water was plentiful it was found that it did the required separation hetter and more economically than air, a method of separation which has heen and is still in use everywhere all over the world. The prospector, digger, explorer, and even the tourist nowadays provides himself with a "pan" in which to wash a sample of "dirt" at the nearest stream. From the pan comes the "cradle," "long tom," and the innumerahle mechanical arrangements for the separation of gold from earthy matters. Up to this point we have only mechanical means of separatlon which depend on the high specific gravity of gold compared with sand, clay, etc., hut at thls stage in the evolution of gold extraction we find the first move made toward a chemical method. When there was a lot of rich dirt in his pan the digger found it very difficult to wash away the last of the sand without losing a large proportion of the finely divided gold, so he hit on the expedient of pouring in a little mercury, which formed a heavy, massive, though fluid alloy with the gold, making the separation of the last portions of the light granular sand a very easy matter. This plan is still in world-wide use alike hy the solitary digger who lives in a lonely canyon, and hy the well-organized company that "hydraulics" 1000 tons of "pay dirt" per day. Let us now look at the

PRESENT STATE OF THE GOLD INDUSTRY.

Let us imagine a digger who has exhausted all the gravel and pay dirt in the canyon or gully; he travels up the gully looking to the right hand and to the left for traces of the precious metal; occasionally he finds a piece of gold-bearing rock and is led on and on till he finds the source of these auriferous stones to be a reef. Now hegins gold mining proper. A shaft is sunk on the reef or a tunnel driven into it and great masses of rock are brought to the surface, and naturally the miner is led to imitate nature hy crushing this rock to a fine sand and then he modifies the treatment, formerly given to alluvial deposits, to adapt it to the new circumstances. The ore, immediately on heing crushed to powder (which is generally done hy huge gravitation stamps), is carried over an amalgamated copper plate hy a stream of water. In passing over the amalgamated plate the gold is caught hy the mercury, while the sand, now

called tailings, is washed off. The gold is recovered by scraping the amalgam off the copper plate at stated intervals, generally once a month, when by distillation the mercury is recovered as well as the gold separated. If all the gold the ore contained existed in the heavy metallic form, the recovery by this method would be complete and the loss *nil;* but the tailings are frequently found to contain a little gold, and on close examination particles of pyrites and sulphides of the various base metals are found diffused through the mass. When these metalliferous particles are separated from the mass of tailings, it is found that they principally contain the gold, so that it is now usual in practice to pass the tailings through some form of concentrating machinery, of which the well-known Frue vanner is a good example, whereby the pyrites and other sulphides are retained in virtue of their higher specific gravity and the sand washed away. The rich proportion now called "concentrates" may contain up to 20 ounces of gold per ton, though four or five ounces is much nearer the average figure.

IF THE CONCENTRATES ARE EXAMINED

Closely, even microscopically, no free gold can be distinguished, and if they be treated with mercury, they will yield to it little or none of their gold contents. Sometimes a considerable portion of gold may be got from them by a long-continued grinding in cast iron pans in presence of mercury. This grinding seems to force the sulphur and base metals, as well as the gold, into combination with the mercury, so that the bullion got from the amalgam often contains over 95 per cent of copper, lead and other base metals, while there is a corresponding loss of mercury which is carried away partly as sulphide and partly in a "floured state." The flouring is caused by the small globules of mercury being coated with a film of sulphide of mercury, which prevents the particles coalescing. Thus there is a double loss—chemical, by the formation of sulphide of mercury, and mechanical, by flouring. This loss is so well known that concentrates are only treated by this form of amalgamation in localities where nature forbids any more elaborate process. Sometimes the amount of loss may be lessened by roasting the concentrates before amalgamation, but this is by no means a perfect remedy, as the roasting removes only volatile constituents of the concentrates, principally sulphur, while the base metals—lead, zinc, etc., are left in the form of oxide to oxidize and waste their equivalent of mercury. Attempts have also been made to decrease the loss of mercury and increase the yield of gold by adding to the contents of the pan all sorts of chemicals to "doctor" the "sickened"—that is, floured mercury. These chemicals are generally mixtures of sulphate of iron, sulphate of copper, salt, lime, soda, etc. This kind of "doctoring" may be effective in some cases, but it is seldom practiced with intelligence. Where the percentage of concentrates is limited, and where there are a number of mines, it is common for some enterprising man to set up a smelting or chlorination work which is made large enough to deal with the concentrates of the district. I will not take time to describe the various processes of smelting, nor could it be done at any evening sederunt; but we may bear in mind that all smelting processes end in alloying the gold with lead, and cupelling in the usual way, with which we are all familiar. Because of the obvious impracticability of smelting, requiring well-built brick furnaces, coal, fluxes, etc., at the typical gold mine high up on the mountain range, possibly near or beyond the timber line, chlorination is much more commonly practiced and consequently merits a full description. In giving this description, I will confine myself chiefly to the old standard Plattner process as I have seen it practiced in California, where timber is abundant and cheap.

THE FIRST AND ESSENTIAL OPERATION

Prior to chlorination proper is roasting. It is obvious that a mixture of sulphides and arsenides of iron, copper, lead, zinc and metals generally will absorb an almost unlimited amount of chlorine, so that the small proportion of gold present would fare badly in a general scramble of the molecules for chlorine. That the metals may have the least opportunity to combine with chlorine, the sulphur is expelled, and their affinities satisfied as far as possible with oxygen by roasting. The roasting is generally done in a large reverberatory furnace, that has no very noteworthy feature in its construction. The concentrates are charged into the furnace at the cold end, heated very gradually, continually stirred and slowly worked forward into the hottest part, care being taken to admit air freely during the whole operation. Where chlorination is practiced on the most extensive scale, this roasting generally takes about 24 hours, and consumes from a minimum of half a cord to a cord of wood per ton, roasted. (A cord of wood gives about as much heat as a ton of coal.) It is a common saying that the success of chlorination depends more on the furnaceman than on the chlorinator, and on looking into hard chemical facts, we find that this is really the case, for if only one-half per cent of iron were left unoxidized it would absorb nearly one per cent of chlorine, equal to about three per cent of bleaching powder, and all this before the gold gets a single molecule of chlorine. Toward the end of the roasting, and about 15 or 30 minutes before the ore is discharged from the furnace, it is usual to stir in a small proportion of common salt. The object of this is to satisfy with chlorine, as far as possible, copper, zinc and other metals whose oxides have a tendency to form chlorides when they get chloride presented to them in the free state. This chloridizing device is, however, only partially effective, as the chlorides formed are apt to be immediately decomposed under the influence of hot air, and in the case of lead, the oxide of sulphate will not combine with chlorine in the furnace, but combines with it readily when offered moist and at the ordinary atmosphere temperature.

THE ROASTED AND OXIDIZED ORE

Is now sprinkled with water to make it slightly moist and is then charged into a wooden vat having a perforated false bottom. The chlorine, generated at an outside source, is led in between the true and false bottom, and gradually permeates upward through the mass of the porous ore. The small amount of water held by the ore then becomes a saturated solution of chlorine, which gradually acts on the gold, so that in the course of one or two days it may be washed out as the soluble chloride by a further amount of water. This weak solution of chloride of gold is run into a tank, a solution of ferrous sulphate added, precipitate of gold allowed to settle for 48 hours, if possible, and the supernatent solution allowed to flow off. When sufficient gold precipitate has accumulated, it is collected and run into bars. Besides the Plattner form of chlorination which I have described, there are others which vary from Plattner and among themselves in the manner of application of the chlorine—most of them using revolving barrels instead of open vats for the chlorination proper. The best known of these are:

The Mear's process, where chlorine is used under its own gaseous pressure.

The Newbery-Vautin, where air pressure is used:

The Pollok, recently described before this section of the society, where hydraulic pressure is used, and the Thies, where the chlorination is done in a barrel without any pressure, as described in this journal, 1889, 895.

Let us now return to the mine. The deeper we sink down into the reef, we find that while the richness of the ore may remain constant, the proportion of free gold, that is, amalgamable gold, becomes smaller and smaller, while the proportion of gold-bearing sulphides becomes greater and greater till we come to the water level, where it often happens that the free gold leaves entirely and becomes wholly refractory — that is, nonamalagable. The water level is generally regarded as the point where the atmospheric and weather influences cease, and that down to that point the rain water has penetrated and gradually washed away the oxidizable base metals, leaving the inert gold in the crevices of the equally inert quartz, whereas, the ore found below the water level, not having been subjected to oxidizing influences, retains all its metals untouched and unchanged.

AN INTERESTING PROBLEM

Now presents itself: An ore consisting of a complex mixture of silica and the various compounds of iron, copper, lead, zinc, antimony, arsenic and sulphur (for convenience I will include all these compounds under the general term sulphides) and gold in the proportion of 10,000 parts of silica and sulphides to one part of gold, is very much richer than the average auriferous ore, and the question is, how can we best separate the one from the ten thousand? Under favorable circumstances, the gold and the useful metals may be recovered by smelting, but these favorable circumstances, which are proximity of the gold mine to coal, clay, limestone and other fluxes, are quite exceptional, as auriferous reefs are generally found in primary formations. As before implied, chlorination is frequently inapplicable—no attempt is ever made to chlorinate gold ore containing an appreciable quantity of lead—and where applicable is always troublesome and never cheap. When this question presented itself to Dr. Forrest and myself, we tried to find some solvent which, unlike chlorine and mercury, would have a stronger affinity for gold than for sulphides. Acting on this principle, we drew out a list of all probable or possible solvents fulfilling this condition. This list included cyanides, and we found that these salts solved the problem.

THE EXPERIMENTS.

Our experiments were conducted first on a small scale, and on ores of all kinds and from all mines in all parts of the world. The result of these small trials was so satisfactory that we gradually worked from less to more, and in no long time larger quantities were worked, and now the process is in or on the eve of being put in operation in all quarters of the globe. I have now much pleasure in describing the method of working most generally applicable. The ore is ground to about the fineness of sea sand. If, instead of ore, we are working tailings from the amalgamation process, these are generally not to reground, but treated as delivered. The finely divided material is mixed with a solution of a cyanide say cyanide of potassium, containing on an average 0.4 per cent of cyanogen as the cyanide of potassium or other alkali or alkaline earth. The ore and solution are stirred together for about six hours, more or less, this being the average time required to dissolve the gold; in practice the time required is determined by direct experiment. When the gold is known to be dissolved, the pulp is discharged into an ordinary filtering tank, where the filtration may if necessary, be assisted by suction, and where the ore is washed by water or by the waste cyanide solution from a previous operation. The ore, after treatment with cyanide solution, is unchanged to the eye, as almost nothing but the imperceptible proportion of gold present has been removed. The gold now being in solution, the next object is to get it precipitated, and here we encounter a serious difficulty. Gold and cyanogen have such a strong mutual affinity, that it is difficult to get any substance that will separate them. The gold cannot be precipitated by an ordinary method, such as the use of ferrous sulphate or oxalic acid; even sulphureted hydrogen and sulphide of sodium will not precipitate gold from its cyanide solution, though they precipitate silver. On referring to books on electrogilding, we got no assistance, as the invariable method given for the recovery of gold from cyanide solutions was, evaporate to dryness and fuse the residue. We had noticed, however, by experiment, that zinc precipitated gold very feebly, and tried this in the same way that copper is precipitated from its ordinary solutions by scrap iron, but scrap zinc had no effect; then granulated zinc was tried; with a most imperfect and disappointing result; then heating in presence of scrap and granulated zinc, but this had only the effect of forming urea, and assisting the precipitation very little indeed. Further, we tried zinc dust, but still there was no success; finally, we prepared some zinc in a form like sawdust, porous and with a large surface of bright metal. On allowing the cyanide of gold solution to trickle through a mass of the zinc, we found that it trickled out gold free, and better still, we found that the action became more vigorous and pronounced after a portion of the gold had been precipitated on it, doubtless as gold and zinc formed together a more powerful electro-chemical precipitant than zinc by itself. An arrangement of a porous mass of zinc like a sponge formed a chemical filter, which at once precipitated and collected the precious metal; indeed, so like an ordinary water-purifying device was this zinc filter, that many nontechnical visitors formed and held tenaciously to the idea that the gold was in suspension in the cyanide solution, and the zinc was used merely because of its durability.

IMPROVEMENTS IN DETAIL

Were made in the direction of increasing the surface and decreasing the weight of the zinc, till now we have it in threads, 1 lb. of which occupies about two gallons measure. The zinc in this form is possessed of enormous chemical activity, of which the strongest and most direct evidence is the fact that it burns in the air like thin shavings of wood. When the gold has been deposited, it is necessary to separate it from the excess of zinc present. The filiform structure of the zinc, and the exceedingly fine powder, as which the gold is deposited, render this an easy matter. The filiform mass of zinc with gold powder adhering is vigorously shaken in water, when the gold falls off, and the fibrous particles of the zinc may be collected in a sieve. The gold settles easily, is collected, and fused directly into bullion.

Having now described the chief points in the process from the technical standpoint, let us look at the

PURELY CHEMICAL ASPECT

It presents. Reference has already been made to the fact that a cyanide solution acts on the gold in ores in preference to the sulphides of base metals with which it may be combined or associated; this selective action is the keystone of the whole process. It is known that metallic gold is dissolved by a cyanide; it is also known that sulphides of copper, zinc and iron artificially prepared are readily acted on by a cyanide solution; but we found a very different state of affairs in treating ores where these or similar compounds exist prepared by the hand of nature herself. Nature seems to render the base metallic compounds insoluble, while the gold combined with or contained in them is more easily acted on than the metal itself. This at once raises the question—how does gold exist in base refractory ores; is it combined or free? This question, I admit, I cannot answer satisfactory to myself. Judging from theoretical considerations only, I think gold should exist almost invariably in the free state, for if we assume that sulphides, pyrites, etc., were formed by deposition from aqueous solution, the gold would be deposited in the metallic state. This may be shown by dropping some powdered pyrites into a solution of chloride of gold, when gold will be precipitated as metal; on the other hand, let us assume that the pyritous formations carrying gold were formed by igneous agency, in this case the gold ought to be metallic, too, because any sulphide of gold already existing would be decomposed by the high temperature, and of course sulphide of gold cannot be formed at a high temperature. It is true that sulphide of gold may combine with any alkaline sulphide and resist decomposition by heat, but such a combination as a matter of fact does not occur in nature. Telluride of gold, and I think antimonide of gold are not decomposed by heat, but they occur in small quantities only, and do not affect the general argument. In spite of these theoretical considerations, however, we have strong evidence to show that gold exists in several different states of combination or molecular structure. Let me give

ONE CASE IN ILLUSTRATION.

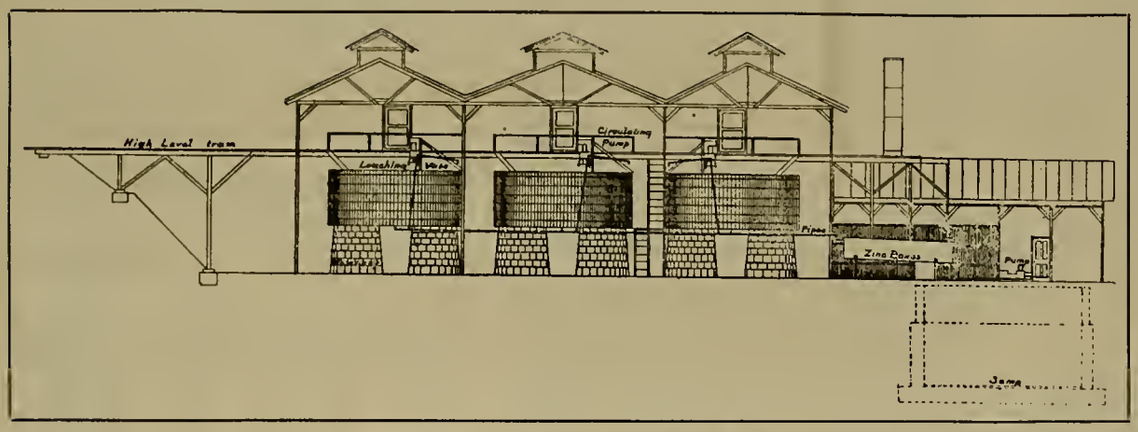
A sample of tailings from the ordinary process of stamping and amalgamation was received, and I think it may safely be assumed that the mercury had extracted some gold from the ore which produced these tailings. We treated the finely ground tailings by alkaline solution of bromine which extracted a considerable portion of gold, and the bromine treament was repeated time after time till it ceased to extract gold; then it was treated with a hot solution of ferric bromide which yielded a further quantity of gold. This treatment was repeated time after time till it ceased to extract gold, and finally the residue of tailings were smelted and a still further quantity of gold produced. As this ore yielded its gold in stages to the four different processes of amalgamatioo, treatment with bromine, treatment with ferric bromide and smelting, we infer that the gold existed in four different states, mechanical or chemical. Notwithstanding the complex nature of these tailings which consisted of all sorts of sulphides with the fourfold gold, the cyanide acted on it, almost perfectly extracting 93 per cent of the precious metal, whilst the higher extraction by any of the bromination methods was about 40 to 50 per cent. The cyanogen seemed to have an affinity for gold and a power of penetration so much stronger than mercury of bromine, that it broke through barriers impregnable to them and captured the gold. Elsner has stated that metallic

GOLD DISSOLVES IN CYANIDE

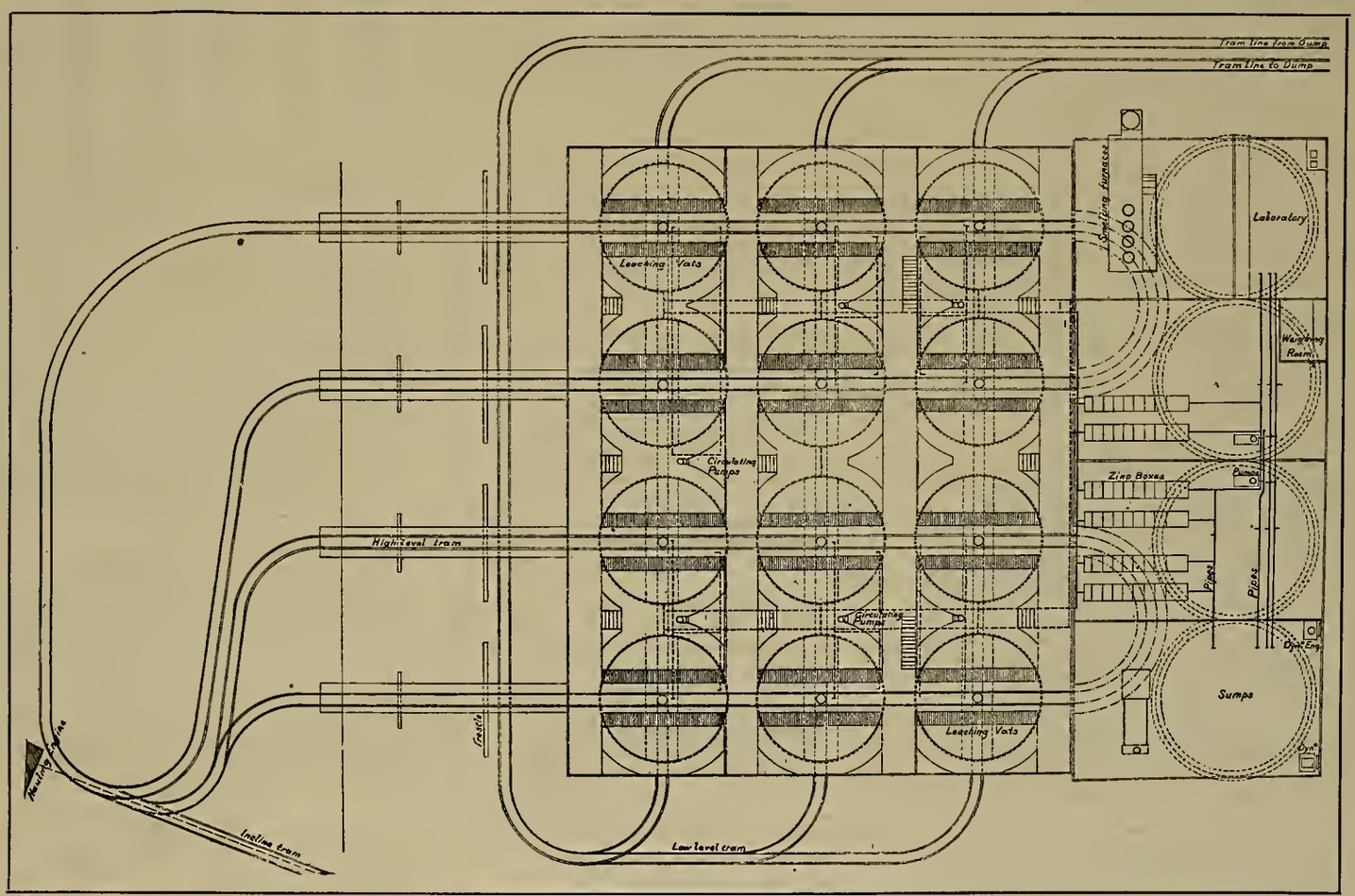
Of potassium only in presence of oxygen. Not having seen the original account of Elsner's researches, I am not in the position to criticise his experiments, but I never could find that the presence of oxygen was necessary either to dissolve gold by itself or from ores by cyanide. If a piece of gold be immersed in a cyanide solution so that air to act on it would have to penetrate two inches or three inches of the solution, the gold will dissolve in its usual slow and steady fashion. The equation shows that either oxygen must be absorbed or hydrogen evolved. I have seen no evidence of the former, and can adduce no proof for the latter, but I think the latter more probable, because I cannot conceive oxygen penetrating even a film of cyanide solution without at once oxidizing the cyanide to cyanate, whereas in the other case, as suggested to me by my friend Mr. Ellis, the nascent hydrogen may be at once seized by the excess of cyanide present and ammoniacal compounds formed. However, we do not concern ourselves much with the reactions of pure gold, but as a matter of

fact we cannot find that oxygen plays any part in the cyanide extraction of gold from ores. We have treated an ore with cyanide with free access of air, and then a parallel experiment was done with boiled water, the bottle filled to the stopper with solution and ore, and the stopper sealed. The extraction was the same in both cases.

We have so far only considered ores which are refractory from chemical as well as mechanical causes, but ores are frequently found in which the gold is refractory from a purely mechanical cause, which is the extremely fine division of the gold. The cyanide process is quite as applicable to this class of ore as any other. These ores are generally spongy and absorbent, and this, we find, enables us to dispense with stirring the ore and cyanide solution together, the same end being accomplished by allowing this cyanide solution to percolate slowly through the mass—a clear saving in power.



LONGITUDINAL SECTION OF CYANIDE WORKS.



PLAN OF CYANIDE WORKS FOR TREATMENT OF GOLD ORE TAILINGS, SOUTH AFRICA.

THE ADVANTAGES CLAIMED

For the cyanide process over smelting and chlorination are: As compared with smelting, it requires no furnaces and no coal, and no fluxes, and thus may be used successfully in remote situations where smelting is utterly impossible. As compared with chlorination, cyanide process involves no roasting, therefore no furnaces and no fuel. Moreover, by the cyanide process, ores containing lead, zinc or earthy carbonates, which cannot be worked to profit by chlorination, may be easily and profitably treated as any other. For chlorination, about seven per cent of the weight of the ore to he treated often has to be carried to the ore in the form of bleaching powder, say 1½ per cent, bisulphate of soda 2 per cent, and sulphate of iron 2 1-2 per cent, with packing, say of 1 per cent, whereas about 1 per cent of the ore to be treated will cover the weight of the necessary cyanide, zinc and packing. Thus, by chlorination, one ton of chemicals will treat only about 14 tons, whereas hy the cyanide method one ton will treat 100 tons.

Moreover, chlorination does not extract any silver, but by the cyanide method the most of the silver—invariably associated with gold in ore—is extracted along with the latter metal at the same operation. For the sake of simplicity, I have not named silver in the body of this paper, hut the remarks made in reference to gold generally apply to the silver associated with it.

From what I have seen of gold mines and gold mining in the Sierra Nevada, in the Rocky Mountains, in the Southern States of America, in Nova Scotia, from the many kinds of ore I have seen from all parts of the world, and from what I know of the selective and energetic action of cyanides, I confidently predict that cyanide of potassium, hitherto used only to polish amalgamated plates, will take a front rank as chief agent in gold extraction.—*J. S. MacArthur, in Journal of the Society of Chemical Industry.*

RESULTS OF WORK ON TAILINGS.

At Witwatersrand, Transvaal, South Africa, is a gold mining camp now making a very large annual production, in fact more than the whole State of California. These are generally known as the Johannesburg mines. The product is gradually increasing, and the very best methods of reduction have been adopted. In addition to the ordinary milling process, extensive chlorination and cyanide process plants have been erected by some of the companies. The Robinson Gold Mining Company has put up a cyanide plant capable of dealing with 75,000 tons of tailings per annum. Both the chlorination and cyanide works were designed by Charles Butters, a metallurgist, formerly of Shasta County, California.

At first they had an old plant for this process, erected by the Gold Recovery Syndicate, to carry out a contract with the Robinson Company for the treatment of 10,000 tons of tailings. The contract was completed at the end of June last, and the company availed itself of the option to purchase the plant and to work tailings by this process on royalty. The works have since been fully employed to the company's advantage, the bullion produce for the year 1891 amounting to 19,260 ounces of gold.

The new cyanide works (shown in the plans) were designed, erected, and started partial work in December last, producing for that month 1043 ozs., 12 dwts. of bullion. The works are now in perfect order, and in conjunction with the old works will treat about 8000 tons per month.

The plant is of excellent construction, and designed for durability, capacity and cheap work. It consists of 12 circular open leaching vats of special improved design, each having a capacity of 2000 cubic feet, and holding 100 tons of tailings and cyanide solution. The vats, built upon elevated tunnelled stone foundations, are filled from high level tramway above them, and emptied through trap doors in their center into tram-cars in the tunnel below.

Next in order and placed below their level is a series of zinc precipitating boxes, designed to continuously precipitate gold from solution as it passes from leaching vat to sump. Underneath the zinc boxes are four 200-ton sumps, brick and cemented tanks set in the ground. In these sumps are prepared and stored the solutions for dissolving and washing out the gold.

On the top of them are placed a double set of duplex pumps arranged that both, or either, will throw from any sump into any leaching vat. On the tram-level above the vat is a 10-h. p. double drum winding engine and boiler employed to hoist out of tailing pits the tailings to be treated.

The plant includes four furnaces of large capacity for the smelting and refining of bullion, as also laboratory and weighing room. A very careful system of tram-lines is laid down, on both high and low levels, for delivery and discharge of tailings in the most direct and efficient manner. Works, pits and dumps are lit by electric light. Lathes for cutting zinc are employed, and a 12-h. p. (Archer) engine with 16-h. p. boiler, supply all power and steam required. The whole is covered by an airy building of wood and iron.

The methods of work are: Hoisting tailings and filling vats; pumping cyanide solution on to the tailings (in the vats) to dissolve their gold; running off this gold solution into zinc boxes and precipitating the gold; return of the cyanide solution into the sump below for repeated use; col-

lecting, smelting, and refining of the gold precipitated.

The gold produced from all sources by this company in 1891 was as follows: Mill, 66,850 ozs.; chlorination works, 7881 ozs.; cyanide works, 19,260 ozs; chlorination from concentrates bought, 101 ozs. Total, 94,092 ozs. 10 dwts.

The percentage of gold now recovered from all sources is as follows:

Mill	71.04	94.82%
Concentrates 95% of 5.41%	5.13	
Cyanide 73% of 25.55%	18.55	

The company employs 1110 men, of whom 257 are whites and the rest Kaffirs. The cyanide works at this mine have been quite successful, and led to the adoption of the system at other mines in the district.

SOUTH AFRICAN CORRESPONDENCE.

From a letter received by Almarin B. Paul from his South African correspondent, who is one of the leading chemists conoected with the several large companies there, workiog the MacArthur-Forrest process, and bearing date May 14, 1892, we bave been permitted to extract as follows:

"I have treated concentrates assaying 10 ounces of gold per ton, by percolation, and obtained from 94 to 98 per cent extraction. * * * *

"We are erecting at present two large mills, which bring up the number worked by ourselves to nine. There are also several working on royalty. One of the new mills which we are erecting at present will treat over 3000 tons a montb. Tbe other mill is a new venture like yours. [The Paul wet way, using solution in the battery.—ED.] We have, for this mill, fitted up 12 large circular vats, their capacity being 18 feet in diameter and five feet deep.

* * * * *

"The Laoglasgte Estate G. M. Co. have fitted up the largest cyanide works in Johannesburg. Tbey have over one-half million tons of tailings ready for treatment, besides having 180 stamps. Tbey have fitted up five large circular tanks, each tank will hold from 400 to 500 tons of tailiogs, and they intend to treat from 8000 to 10,000 tons a month. * * * * *

"The gold produced in the month of April by the MacArthur-Forrest mills was £33,202 as far as reported."

EXPERIENCE AT THE MERCUR MILL.

The pioneer mill to operate the cyanide process in Utah is owned by the Mercur Gold Mining and Milling Co. The adoption of the process was owing to a visit, by Mr. Gill S. Peyton, the treasurer of the company. He had shipped to the mill of the Gold and Silver Extraction Co. in Denver, Colo., a carload of ore from his mines in Utah. The Denver mill was turned over to his entire control and the trial was conducted under his personal management. He is an assayer and chemist of ability and superintended all the tests made. The result (an extraction of from 85 to 90 per cent) so well pleased him that he prevailed upon his company to adopt the process.

In a letter recently received by the Denver Co., he reports his experience in connection with the process, as follows:

Having used the MacArthur-Forrest process for six months, we feel that we have gotten beyond the experimental period, and as our experience may be beneficial to parties having low-grade ores, will briefly outline:

The Mercur Gold Mining and Milling Co., of Fairfield, Utah, eight months ago had just completed a pan-amalgamating mill at a cost of $30,000. Like other mills, it proved a dismal disappointment to the stockholders. Trial after trial only showed a saving of from $3 to $4 per ton from $20 ore. At just about the time we had demonstrated that amalgamation was a failure on our ore, we received circulars from you of the MacArthur-Forrest process. In just three days after receiving these circulars I was on my way to Denver to investigate and see what your process would do for our ore. Must state had very little faith in the process, and especially when told by older hands in the milling business that it was money thrown away to investigate in such an absurd thing as cyanide extracting gold, but it proved to be even more than was claimed for it.

Our first experiment was to agitate the ore in the cyanide solution. This we found impractible on our particular ore, owing to considerable clay that it contained. So much slime was made that the solution would not pass through the pulp. Then percolation was tried with encouraging results. The great surprise to us was tbe coarseness we could extract the metal from the ore. A great part of the pulp treated contained pieces as large as hazel nuts, and showing an extraction of from 85 to 90 per cent. After 16 days of experimenting in our assay office, the work was placed before the Board of Directors of the Mercur Company and approved. On tbe adoption of the MacArthur-Forrest process, a remodeling of the mill immediately followed. From 10 to 15 tons per day was the tonnage until the first of April, 1892, when the capacity was increased to 50 tons per day.

Our extraction at first showed a saving of 75 per cent and a consumption of two and one-half pounds of cyanide per ton.

The last 90 days' run up to March 1st (when the mill was closed down to increase capacity) gave an extraction of 88½ per ceut, with only one pound of cyanide per ton consumed.

A brief description of the manipulation at the Mercur Mills may be of interest here. The ore passes from the rock breaker to a set of 20-inch wall rolls, and on into a second set of smaller size, where it is crushed into proper fineness, a large proportion of the pulp being as large as a small pea (we use no screens). From here it is elevated into storage bin; from this bin the tanks are filled by car, to a depth of 33 inches. The cyanide solution is turned on, and pulp left standing in solution for 12 hours; then the solution is passed through continuously until gold is extracted, which varies from 36 to 48 hours. The solution now, containing gold, as it passes from the tanks, flows into a sump from which it is pumped into a tank above the leaching tanks. From this tank it flows through a box which contains a sufficient amount of zinc shavings to clean all the metal from the solution. From the zinc box it passes into the standarding tank. Here the solution is brought up to the standard strength, which is one-fourth of one per cent, and again starts on its tour through the leaching tanks, with an occasional feed of cyanide. This solution never grows tired, for the same solution is now in use that we started with six months ago, and still has as great affinity for gold as when it started. A great advantage is derived where water is an item by the amalgamating process. We were limited to about 25 tons per day owing to the scarcity of water. The same amount of water would permit us to work by the MacArthur-Forrest process 150 tons per day.

Comparative results by actual experience on our ore by amalgamation and the MacArthur-Forrest process are as follows:

Fifteen hundred tons of our ore treated by amalgamation gave an average extraction of 20 per cent at a cost of $4.25 per ton for milling.

Sixteen hundred tons of our ore treated the past 90 days by the MacArthur-Forrest process, average extraction of 88.5 per cent at a cost per ton of $2.25 for milling.

Our appreciation of the process is fully demonstrated by the fact that during the month of March we increased our capacity as before stated to 50 tons per day. The last 16 days I have made over 100 tests on refractory low-grade gold and silver ore from different parts of the country, and my experience so far has been that the greater number of them can be worked to a high percentage by the MacArthur-Forrest process.

CYANIDE OF POTASSIUM AS A LIXIVIATION AGENT FOR SILVER ORES AND MINERALS.

In the year 1866, while in the employ of the Ontario Silver Mining Company at Park City, Utah Ter., I made the discovery, novel to me at least, that cyanide of potassium was a potent solvent of the various minerals of silver which occur in the so-called rebellious ores that are generally treated by roasting and subsequent lixiviation. I made a series of experiments—too few indeed, to be decisive, yet sufficient to induce the belief that the investigation was worth prosecuting for its possible future metallurgical value. Long continued application in another field has interfered with a further study of the subject. The result of such experiments as were made are given herewith in the hopes that others working in the same line of investigation may find them of interest. According to Storer (Dict of Chem. Sol.), "Ag_2S is soluble in a solution of K Cy only when the latter is used in large excess; the small portion thus dissolved is reprecipitated, however, for the most part by the addition of water." Percy says: "It is stated that in an aqueous solution of cyanide of potassium (Ag_2S) is 'nearly insoluble,' but we have found it to dissolve in a very sensible degree, in a moderately strong solution of that salt, whether cold or hot, though more quickly in the latter. According to Freseniue it is insoluble.

Various experiments were made to determine this question of solubility. They were all submitted to like conditions. The substance experimented upon was weighed into a beaker, the cyanide solution of the indicated strength was added, and the beaker then placed on a sand bath heated to a general temperature and allowed to stand for twelve hours. The cyanide of potassium used was such as is usually furnished to mills, and which rarely contains above 50 per cent of K Cy. The percentage extracted refers to the amount of silver dissolved to one part of this *commercial* cyanide of potassium. The quantity of substance operated on was 500 mgs.; volume of solution, 100 cc.; and strength of solution 5 per cent.

TABLE 1.

Name of Substance.	Per Cent of Silver Extracted.	Weight Dissolved by 1 part K Cy.
Cement Silver	25.0	0.025
Ag S	30.9	0.025
Ag S b_2	64.4	0.023
Ag A S O	97.0	0.057

In the last four experiments 500 mgs. of the copper compounds were added to the silver mineral. The average weight of Ag dissolved to one part of K Cy. as shown in the last column, omitting the fourth line, is 0.025. closely approaching the figure 0 026, which is found three times in this column. In the fifth experiment the copper was attacked more than would be accounted for by the reduction of the Ag_2S to Ag.

The experiments in the following table were made to ascertain the effect of concentrated solutions upon the sulphide of silver. In each case 500 mgs. of Ag_2S (corresponding to 430 mgs. of Ag) were used. As before, the beakers stood in a sand bath for 12 hours under a temperature which did not exceed 100 F. Volume of solution, 500 cc.

TABLE 2.

Strength of solution in percentages per cent.	Mgs. of Ag dissolved.	Percentage of Ag dissolved.
1	130.0	30.2
2	140.8	32.7
3	174.6	40.1
4	211.5	49.2
5	246.3	56.1
5	291.0	57.5
7	348.0	81.0
8	355.1	82.5
9	395.3	98.6
10	423.9	92.1
15	429 1	98.6
20	429.3	99.7
25	429.3	99.8
5	215 0	50.0

The percentage extracted increased with the concentration of the solution, up to a ten-per cent solution. Beyond that point the increase is slow.

An experiment was made, also, to ascertain the effect of the presence of cupric oxide. The result gave a less percentage than when the silver sulphide was alone acted upon by K Cy solution of the same strength and volume. The addition of a copper salt to the solution does not act beneficially. Several cupro-cyanides of potassium were made according to the formulæ of Gwelin, but in no case was there any beneficial result.

Authorities within my reach are silent as to the solubility of metallic silver in a solution of cyanide of potassium. I give below some experiments made to determine this point:

TABLE 3.

Weight of cement silver. Mgs.	Strength of solution. Per cent.	Mgs. of silver dissolved.	Percentage dissolved.	Volume of solution. Cc.	Time of standing, hours.
500	0.50	123.8	24.7	500	12
500	0.50	125.5	25.2	1000	12
500	1 00	138.2	27.5	500	12
500	1.00	109.8	21.9	600	6
500	1.00	127.5	25.4	1000	12
500	2.00	179 5	35.9	1000	96
500	2.00	112.4	22.4	500	12
500	3.00	170.0	34.0	1000	96
500	3.00	100.0	20.0	500	12
500	4.00	145.5	29.0	1000	96
500	4.00	100.0	20.0	500	12
500	5.00	100.0	20.0	1000	96
500	5.00	100.0	20.0	500	12
500	7 00	92.1	18 4	500	12
500	8.00	100.0	20.0	500	12
500	9.00	97.3	19.4	500	12
500	10.00	83.5	16.7	500	12
500	15.00	75.0	15 2	500	12
500	20.00	88 0	17.5	500	12
500	25 00	88.0	17.5	500	12

It will be observed that the results obtained in the table above, reverse those obtained in Table No. 2, *i. e.*, the extraction with Ag_2S is directly proportional to the strength of the solution, and here inversely proportional. The only explanation I can suggest for this curious phenomenon is that when metallic silver is exposed to the action of K Cy, hydrogen gas is evolved from the decomposition of the water by the free potassium, according to the following reactions:

$Ag + 2\,K\,Cy = Ag\,K\,Cy_2 + K$; $H_2O + K = K\,H\,O + H$.

The hydrogen gas causes polarization. In fact, the gas can be seen covering the silver in minute bubbles. The reaction is probably more violent when the solution of K Cy is strong, and, in consequence, the polarization takes place sooner, thus causing lower extraction. The experiment of agitating the cement silver with the solution should have been tried. Exposing the silver to the solution for a greater period of time seems, within certain limits, to have a beneficial action.

The following table contains experiments on raw argentiferous ores. These ores are mainly from well-known localities. They embrace wide varieties of minerals. The results are extremely satisfactory in all but a few instances. They are compared with the results obtained by the Russell process. Five hundred cc of water was used with 25 grammes of commercial K Cy. One-half A T of ore was added, and the beaker allowed to stand on a sand bath until the temperature had risen to 100° F., then removed, filtered, and the residue assayed. This plan was followed throughout in the treatment of ore, raw or roasted.

TABLE 4.

Name of Mine and Locality,	Value of ore in ozs per ton.	Results by Russell's Process, Per cent.	Restlts by K Cy Per cent.	Difference in favor of K Cy.
Daly, Park City, Utah	74.0	17.0	81.0	64.1
Pearsall, Col	75.0	33.0	73.9	40.9
Sombrerete, Mex	407.4	24.9	65.2	40.8
Argenta, Mont	75.2	12.2	51.7	89.5
" Coeur d'Alene	128.8	18.3	55.8	39.7
Sombretillo, Mex	72.0	61.5	97-8	35.7
Highland, Col	51.2	48.1	81.2	33,1
Yedras, Mex	123.5	15.3	44 2	28.9
Manhattan, Nev	166.0	57.2	82.0	25.5
Ramshorn, Idaho	94 8	55.0	80.0	25.0
Parral, Mex	80.0	56.0	89 4	23.4
Ontario, Utah	80.8	44.1	72.5	28.0
Custer, Idaho	24.8	68 8	90.4	21.5
Tybo, Nev	20 8	58.0	71.8	13.8
Silver Reef, Utah	45.2	77,8	82.8	5.0
Horn Silver, Utah	184.0	90.7	93.6	2.9
Bertrand and Geddes, Nev	175 4	11.1	11.8	0.7
Balloonville (tailings(, Nev	12.0	10.0	10.0	0.0
" " "	10.0	35.0	32.0	3.0
Grand Central. Ariz	43.2	93 7	92.6	1.1
Daly, Utah	33.0	45.6	81.7	27.1
" "	80.0	56.0	73.4	17.4

In the above experiments the difference in using a K Cy solution above the Russell process is greatest when the ores are base. For instance, the argentiferous mineral of the ores of the Horn Silver, Grand Central and the Silver Reef mines is mainly kerargyrite. On this ore the difference between the two solvents, when any, is small; but in the case of the Daly, Sombrerete, Yedras, Ontario

and Manhattan ores, the silver minerals are fahlerz, argentite, pyrargirite and argentiferous galenite and mispickels. In some of the ores mentioned are found all of the above minerals. The difference in the results obtained is quite noticeahle, and greatly in favor of the K Cy solution.

Chloride of silver is extremely soluhle in K Cy solutions. Hence it may be readily inferred that if the ore is roasted, and the silver is chloridized, it can he readily extracted hy this solvent. Ih the following table some experiments on chloridized ore are given, showing the results ohtained hy different solvents:

TABLE 5.

Name of Mine.	Value of Ore tu Ounces per ton.	Percentage Extracted by $Na_2S_2O_3$.	Percentage Extracted by Russell's Process.	Percentage Extracted hy Amalgamation.	Percentage Extracted by K Cy.
Alice	33.2	73 7	89.2	.....	92.1
Ontario	47 0	92.2	93 4	.....	95.8
Ontario	47.0	93.7	94.1	.....	95.4
Daly	31.0	89.1	91.7	.....	92.0
Daly	86.6	88.0	.....	90.0	92.4
Daly	89.4	89.9	.....	91.0	92.5
Daly	87.2	91.4	.....	92.0	92.6
	35.2	92.1	.....	91.0	91.4

The following experiments I instituted with a view of ascertaining whether the length of time the ore stood in the solution had any effect or not. They were on unroasted Ontario ore:

TABLE 6.

Time of standing.	Assay value of ore in ozs. per ton.	Ounces extracted per ton.	Percentage.
1 hour.	80.8	68.4	72.3
2 hours.	80.8	58.4	72.3
3 hours.	80.8	69.0	73.1
4 hours.	80.8	58.4	72.3
6 hours.	80.8	60.2	74.6
6 hours.	80.8	68.8	72.8
7 hours.	80.8	61.4	76 0
8 hours.	80.8	61.2	75.8
9 hours.	80.8	58.8	72.8
10 hours.	80.8	64.0	79.3
11 hours.	80.8	60.4	74.8
24 hours.	80.8	63 2	78.3

The experiments, while not conclusive, showed a general tendency to hetter results as the time lengthened.

Action of K Cy on Gold-Bearing Ores.—Smee says the auro-cyanide of potassium "may he easily made hy simply placing a piece of pure gold in a solution of cyanide of potassium; hut this process requires some time." I have found that gold-leaf is readily soluhle in a moderately strong solution of K Cy, and fine gold precipitated from solution hy ferrous sulphate is greedily attacked. Cyanide extracts a large percentage of the gold from raw and roasted auriferous pyrites and from gold ores where the gold is present in a finely divided state. The following table is a compilation of experiments on ores containing gold as well as silver. The ores are now worked hy the pan-amalgamation process:

TABLE 7.

NAME OF MINE.	Silver assay value in ounces per ton	Gold assay value in ounces per ton	Gold assay value in dollars per ton	Percentage of silver extracted by Russell's process	Percentage of gold extracted by Russell's process	Percentage of silver extracted by K Cy.	Percentage of gold extracted by K Cy.
Chollar-Potosi tailings	2 60	0 130	$ 2 68	.....	.....	70.4	76.2
Minas Prietas tailings	5.30	0.220	4.54	39.0	54.6	40.4	86.4
Minas Prietas tailings	9.70	0.277	5.72	27.8	56.7	80 4	85.6
Atlanta, Idaho	5 20	0.600	12.40	.....	63.4	78 6	63 4
Con. Cal., Comstock	103 6	2 260	46.71	9.1	80.4	49.8	38 8
Cueva Danta	2000.0	5.500	113.68	.....	9.0	.....	12.5
Paradise Valley	49.2	0.090	1.86	17.9	33.0	25.8	77.8

PRECIPITATING AGENTS.

Tbe foregoing experiments show that silver can be successfully extracted from its ores hy a K Cy solution. This would be of no metallurgical importance unless it could suhseqnently he precipitated from the aolution in a satisfactory condition. Various methods suggest themselves, but none have heen sufficiently tried. Theoretically, the hest precipitant would he the sulphide of potassium (K_2S), as its use would restore to the solution the molecule of K Cy, which is neutralized when the silver is dissolved. This K_2S, however, is unavailahle hecause of its unstability; it decomposes quickly. "Cadmium, mercury and silver are easily precipitated from the solution of their double cyanides, nickel, copper, zinc and manganese slowly and imperfectly; iron and cobalt not at all." (Watt's Dic. of Chem.) Contrary to the apparent authority in the ahove quotation, H_2S will not answer. Liver of sulphur, even if it did not contaminate the solution, would hardly he of use; for, while it precipitates the silver out of the liquor from some ores, yet with other ores, curiously enough, it fails completely.

The reaction in case K_2S should he used would be as follows:

$$2\,K\,Ag\,Cy + K_2S = Ag_2S + 4\,K\,Cy.$$

In case liver of sulphur was used, the reaction would be much more complicated.

The final and hest method ia electrolytically. Smee saya: "The reduction of silver metal from the solution (of K Cy) is easily performed, and ia economical, hy the aingle cell process." A atrip of C. P. copper placed in aolution of K Cy containing silver, is rapidly coated with the precious metal. The completeness of this reaction I have never teated. By the aid of a dynamo, the silver could he easily deposited with little cost on sheeta of copper. The principal objection to this heing the charging the solution with copper.

Objectiona which might be urged against the use of K Cy aa a lixiviation agent:

1. The poiaonous qualities of the solution.
2. Cyanide of potassium in strong aolution is easily decomposed by exposure to heat and air.
3. The excessive cost of the chemical.
4. Its great solvent powera for hase metala. As for the firat ohjection, the same plea ia urged against the use of quicksilver.

The second ohjection ia more valid. But, in a weak solution, such as would he used in the lixivation of ores, the decomposition would take place slowly, if at all, where the solution is in constant agitation. The decomposition of a solution of K Cy exposed to the atmosphere of a small room was scarcely perceptihle. The third objectionahle point arises from the small demand for K Cy. Let the demand be increased, and there is uo reason, even with the crude process of manufacture used at piesent, why it should not he produced at a reasonable cost; and with an increased demand for it, the methods of manufacture would he improved upon, and the cost lessened still further. Tbe fourth objection is a good one. Many copper, lead and iron salts would he carried into the solution if it was applied directly to roasted ores. On raw ores tbe effect would he less pronounced.

If, however, tbe solution was applied after the wash-water, and after a preliminary leaching by $Na_2S_2O_3$ the quantity of hase metals taken up by the cyanide solution would he reduced to a minimum.

From tbe foregoing it would appear that to work with a solution of cyanide of potassium on a large scale, if practicahle at all, the cyanide of potassium had hest he used in a weak solution (of ahout 0.5 per cent) following a preliminary leaching by hyposulpbite of soda, the hyposulphite then being washed out of the ore hy water and the cyanide applied. After the cyanide stands on the ore for the necessary time, it shonld he drawn off into its own precipitating vats, in which precipitation by the adopted method—electrolytic preferably—could take place. The "plant," with the exception of the extra vats, storage tank and dynamo, would he similar to every leaching plant used for the Russell or the ordinary hyposulphite processes.

In conclusion, I would say that the foregoing tahles are presented with hut few comments, as more extended observation and experimenting is necessary before deductions of anv metallurgical value can he drawn.

Many of the experiments were made with some of the most rebellious silver ores that occur in the Western mines or in Mexico. The results are flattering. That a solution of cyanide of potassium is a powerful solvent of silver in its ore is beyond question. The silver, too, can he recovered from its solution. In fact, the "process," if it may be so called, appears feasible, and it may be well to follow it up.—LOUIS JANIN, in *Engineering and Mining Journal*, Decemher 29, 1888.

The MacArthur-Forrest Patents.

418,137. PROCESS OF SEPARATING GOLD AND SILVER FROM ORE.—John S. MacArthur, Pollokshields, county of Renfrew, and Rohert W. Forrest and William Forrest, Glasgow, county of Lanark, assignors to the Cassel Gold-Extracting Company (Limited), Glasgow, Scotland. Filed April 4, 1889. Serial No. 305,998. Patented in Natal Sept. 11, 1888, No. 32: in New South Wales, Sept. 27, 1888, No. 965; and in Tasmania, Sept. 29, 1888, No. 609. Patented Dec. 24, 1889.

To all whom it may concern; Be it known that we, John Stewart MacArthur, residing at Pollokshields, in the county of Renfrew, and Robert Wardrop Forrest and William Forrest, both residing at Glasgow, in the county of Lanark, Scotland, all subjects of the Queen of Great Britain, have invented certain new and useful Improvements in the Process of Separating Gold and Silver from Ores (for which we have received Letters Patent in Natal, No. 32, dated Sept. 11, 1888; New South Wales, No. 965, dated Sept. 27, 1888; and Tasmania, No. 609, dated Sept. 29, 1888); and we do hereby declare that the following is a full, clear and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in the process of separating precious metals from ores described in Letters Patent of the United States, No. 403,202, granted to us May 14, 1889. In that process a cyanide is used as the separating agent, and it has been found that ores containing pyrites or sulphurets which have been exposed to the weather and become partially oxidized absorb a comparatively large quantity of the cyanide.

The ohject of this invention is to economize the process hy preventing the absorption of the cyanide.

The invention consists in separating precious metals from ores hy first neutralizing the ore by the addition of an alkali or alkaline earth, and then leaching such prepared charge with a cyanide solution.

In carrying out the first or preparatory step of this improved process, we take ore containing iron pyrites or other compound which has become partially oxidized by exposure to the weather and mix with it, when in a powdered state, a sufficient quantity of potash, lime, or other alkali or alkaline earth, to neutralize the salts of iron or other objectionable ingredients formed by the partial oxidation.

The quantity of alkali or alkaline earth to be employed will depend upon the nature of the ore, and must he determined hy first taking a test quantity of the particular ore to he treated and adding the alkali or alkaline earth thereto until the alkali ceases to he absorbed. Wben this condition is reached, the liquid will cause red litmus paper to turn blue. The proportion of the alkali or alkaline earth so absorbed will indicate the proper proportion thereof to be added to the bulk of the ore to be treated. In case lime is employed, one per cent of the alkali to 99 per cent of ore will generally he found sufficient. After this preparatory treatment, the ore (which may consist of tailings or residues from other processes or operations) is treated with the cyanide solution by heing agitated therewith or by heing ground therewith in a pan-mill or other suitable grinding-mill; or, as we find preferable in the case of some ores, the cyanide solution may be made to percolate through said ores one or more times until all or nearly all the precious metals are dissolved. For this percolation, very simple tanks, vats or vessels may be used, such vessels heing provided with permeahle false hottoms or any suitahle filtering apparatus. The cyanide solution containing the gold or silver is next made to pass through a sponge of zinc, whereby said metal is precipitated from the solution and retained in the sponge. The zinc sponge is preferably composed of fine threads or filaments of zinc. These zinc threads are formed in shavings cut by a turning-tool from a series of zinc disks held in a lathe; or the sponge may be formed by passing molten zinc, at a temperature just above the melting-point, through a fine sieve, and allowing it to fall into the water. The sponge thus formed presents a very large contact-surface for the solution, and it does not become easily choked.

The precious metals may be separated from the zinc sponge by distillation; or the zinc sponge containing the precious metal may be placed in a suitable sieve and suhjected to a screening operation, preferably under water. In this operation, the greater part of the precious metal will pass through the sieve and the greater part of the zinc sponge will remain therein.

We claim as our invention—

1. The process of separating precious metal from an ore, which consists in neutralizing the ore hy the addition of an alkali or alkaline earth, and then leaching the neutralized ore with a cyanide solution.

2. The process of separating precious metal from an ore, which consists in neutralizing the ore by the addition of an alkali or alkaline earth, then leaching the neutralized ore with a cyanide solution, and then passing the cyanide solution containing the precious metal through a sponge of zinc, substantially as set forth.

JOHN STEWART MACARTHUR,
ROBERT WARDROP FORREST,
WILLIAM FORREST.

Witnesses: Robert Jamieson MacKinlay, Charles Keith Ritchie.

403,302. PROCESS OF OBTAINING GOLD AND SILVER FROM ORES.—John S. MacArthur, Pollokshields, County of Renfrew, and Robert W. Forrest and William Forrest, Glasgow, County of Lanark, Scotland. Filed Nov. 9, 1887. Serial No. 254,699. (No specimens.) Patented in England Oct. 19, 1887, No. 14,174; in Cape of Good Hope Jan. 7, 1888, No. 6,101; in Victoria Jan. 19, 1888, No. 5,572; in New South Wales Jan. 21, 1888, No. 453; in South Australia Jan. 23, 1888, No. 948; in Tasmania Jan. 24, 1888, No. 529; in New Zealand Feb. 1, 1888, No. 2,775; in Canada Feb. 6, 1888, No. 28,471; in France April 6, 1888, No. 189,808; in Belgium July 24, 1888, No. 82,673; in Brazil Aug. 23, 1888, No. 619; in Portugal Aug. 30, 1888, No. 1,272; in Italy Sept. 30, 1888, No. 23,852; and in Spain Oct. 2, 1888, No. 8,538. Patented May 14, 1889.

To all whom it may concern: Be it known that we, John Stewart MacArtnur, a subject of the Queen of Great Britain, residing at 15 Princes street, Pollokshields, in the county of Renfrew, Scotland, and Robert Wardrop Forrest and William Forrest, both subjects of the Queen of Great Britain, residing at 319 Crown street, Glasgow, in the county of Lanark, Scotland, have invented certain new and useful Improvements in Processes of Obtaining Gold and Silver from Ores (for which we have obtained patents in the following countries: Great Britain, No. 14,174, dated Oct. 19, 1887; Cape of Good Hope, No. 6,101, dated Jan. 7, 1888; Victoria No. 5,572, dated Jan. 19, 1888; New South Wales, No. 453, dated Jan. 21, 1888; South Australia, No. 948, dated Jan. 23, 1888; Tasmania, No. 529, dated Jan. 24, 1888; New Zealand, No. 2,775, dated Feb. 1, 1888; Canada, No. 28,471, dated Feb. 5, 1888; France, No. 189,808, dated April 6, 1888; Belgium, No. 82,763, dated July 24, 1888; Brazil, No. 619, dated August 23, 1888; Portugal, No. 1,272, dated Aug. 30, 1888; Italy, No. 23,852, dated Sept. 30, 1888; and Spain, No. 8,538, dated Oct. 2, 1888), and we do hereby declare that the following is a full, clear and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same:

This invention has principally for its object the ohtaining of gold from ores; but it is also applicable for ohtaining silver from ores containing it, whether with or without gold, and it comprises an improved process, which, while applicahle to auriferous and argentiferous ores generally, is advantageously and economically effective with refractory ores, or ores from which gold and silver have not been satisfactorily or profitahly obtainable by the amalgamating or other processes hitherto employed, such as ores containing sulphides, arsenides, tellurides and compounds of base metals generally, and ores from which the gold has not heen easily or completely separable on account of its existing in the ores in a state of extremely fine division.

The invention consists in subjecting the auriferous or argentiferous ores to the action of a solution containing a small quantity of cyanide, as hereinafter set forth, without any other chemically active agent, such quantity of cyanide being reckoned according to its cyanogen, and the cyanogen being proportioned to the quantity of gold or silver, or gold and silver, estimated by assay or otherwise to be in the ores under treatment. By treating the ores with the dilute and simple solution of a cyanide, the gold or silver is, or the gold and silver are, obtained in solution, while any hase metals in the ores are left undissolved, except to a practically inappreciable extent; whereas when a cyanide is used in combination with an electric current or in conjunction with another chemically active agent—such as carbonate of ammonium, or chloride of sodium, or phosphoric acid—or when the solution contains too much cyanide, not only is there a greater expenditure of chemicals in the first instance, but the hase metals are dissolved to a large extent along with the gold or silver, and for their subsequent separation involve extra expense, which is saved hy our process.

In practically carrying out our invention, we take the ore in a powdered state and mix with it the solution of cyanide in a vessel made of or lined with any material not appreciahly acted on by the solution. We employ a vessel made

of or lined with wood; but it may be made of or lined with any ordinary inert material, such as stone, brick, slate, rubber, gutta percha, cement, glass, earthenware, iron (plain, tinned or enameled) or lead. The process is expedited by stirring or triturating the mixture of ore and solution intermittently or continuously, for which purpose any convenient mechanical agitator may be fitted to the vessel. A pan-mill with edge runners or other known triturating device may be advantageously used. The solution is allowed to act on the ore until the gold or silver is all, or nearly all, dissolved, and the solution is then drawn off from the ore or undissolved residue.

Any cyanide soluble in water may be used, such as ammonium, barium, calcium, potassium or sodium cyanide, or a mixture of any two or more of them. We regulate the quantity of cyanide so that its cyanogen will be in proportion to the quantity of gold or silver in the charge of ore; but in all cases we dissolve it in sufficient water to keep the solution extremely dilute, because it is when the solution is dilute that it has a selective action such as to dissolve the gold or silver in preference to the baser metals.

In dealing with ores containing, per ton, 20 ounces or less of gold or silver, or gold and silver, we find it most advantageous to use a quantity of cyanide the cyanogen of which is equal in weight to from one to four parts for every thousand parts of the ore, and we dissolve the cyanide in a quantity of water of about half the weight of the ore. In the case of richer ores, while increasing the quantity of cyanide to suit the greater quantity of gold or silver, we also increase the quantity of water so as to keep the solution dilute. In other words, the cyanide solution should contain from two to eight parts, by weight, of cyanogen to one thousand parts of water, and the quantity of the solution used should be determined by the richness of the ore. After the solution has been decanted or separated from the undissolved residues, the gold and silver may be obtained from it in any convenient way, such as evaporating the solution to dryness and fusing the resulting saline residue, or by treating the solution with sodium amalgam.

Having fully described our invention, what we desire to claim and secure by letters patent is:

The process of separating precious metal from ore containing base metal, which process consists in subjecting the powdered ore to the action of a cyanide solution containing cyanogen in the proportion not exceeding eight parts of cyanogen to one thousand parts of water.

JOHN STEWART MACARTHUR,
ROBERT W. FORREST.
W. FORREST.

Witnesses—Robt. Dunlop, Wm. Brunton,
Law clerks, both of 160 West George St., Glasgow.

Another Patent of MacArthur's.

411,047. PROCESS OF EXTRACTING PRECIOUS METALS FROM THEIR ORES.—John S. MacArthur, Pollokshields, County of Renfrew, Scotland. Filed December 13, 1887. Serial No. 257,801. Patented September 17, 1889.

To all whom it may concern: Be it known that I, John Stewart MacArthur, a subject of the Queen of Great Britain and Ireland, and a resident of Pollokshields, in the county of Renfrew, Scotland, have invented certain Improvements in the Process of Extracting Precious Metals from their Ores, of which the following is a specification.

My invention consists of an improved process of treating ores to extract precious metal therefrom, more particularly gold from gold-bearing ores, without the use of mercury and without roasting, so that a saving of fuel and furnaces is effected.

The chief feature of my invention consists in the use of perbromide of iron for the extraction of precious metals from their ores.

In carrying out my invention—for the extraction of gold, for instance, from gold-bearing ores—it is first necessary to have the ore free, or nearly free from silver, copper, lead and zinc. If the ore is naturally free, or nearly free from these metals, I proceed at once with the treatment of the ore to extract the gold. For this purpose the ore must first be in a powdered condition, and then I add a solution of perbromide of iron to the powdered ore without any preparatory chemical treatment. The solution of perbromide of iron dissolves the gold from the ore. This action may be much facilitated by the appliance of heat to the solution. A temperature which will give good results, is that at which the solution boils, and the solution may be under pressure in a closed vessel, if necessary. When the ore contains silver, copper, lead, or zinc in appreciable quantity, I first treat the ore with a solution of a ferric salt (such as perchloride or persulphate) to remove these metals, as has been heretofore done. The ore thus freed from these substances is then treated with perbromide of iron, as already described. The gold may be recovered from the solution of perbromide of iron by filtration through charcoal or coke. The solution of bromide may be used several times over; but by repeated use it gradually becomes converted into protobromide of iron. This may be reconverted into perbromide by the addition of bromine or other well-known means.

By the use of perbromide of iron for the treatment of gold-bearing ores in the manner described, the gold may be extracted without the use of mercury and without roasting, thus effecting a saving of fuel and of furnaces.

I do not desire to claim exclusively, or to restrict myself in all cases to the use of ferric salts for the separation of silver, copper, lead or zinc from ores containing those metals; nor do I desire to claim or restrict myself to the use of any special means for the reconversion of iron into perbromide of iron, but I claim as my invention:

1. The mode herein described of extracting gold from its ores, which consists in dissolving the gold out of the ore by treating the latter to the action of perbromide of iron, as substantially set forth.

2. The mode herein set forth of extracting gold from its ores by first removing the silver, copper, lead and zinc, by means of ferric salts, and then subjecting the ore thus freed from those metals to the action of perbromide of iron, all substantially as described. JOHN S. MACARTHUR.

Witnesses: Edmund Hunt, David Ferguson.

MacArthur's Process of Leaching Ores.

413,808.—PROCESS OF LEACHING ORES—John S. MacArthur, Pollokshields, County of Renfrew, Scotland. Filed Sept. 4, 1888. Serial No. 284,582. Patented Oct. 29, 1889.

To all whom it may concern:—Be it known that I, John Stewart MacArthur, a subject of the Queen of Great Britain, and Ireland, and a resident at Pollokshields, in the county of Renfrew, Scotland, have invented an Improvement in Processes of Leaching Ores, of which the following is a specification:

My invention relates to known processes for treating ores with acids—such as hydrochloric acid—or with solutions of salts having weak bases, such as solutions containing iron, manganese or copper.

My invention is intended for the treatment of any ores containing any one or more of the metals copper, lead, zinc, silver or gold; and my invention is more particularly applicable when the ores contain oxides or carbonates of earth metals, the presence of which causes inconvenience and waste of the agents employed in the processes as hitherto practiced.

By my invention I altogether avoid or very much diminish the inconvenience and waste referred to and the consequent expense by treating the ore with a solution of salt which will give up its acid or a part of its acid to the oxide or carbonate. The salt to be used may be a ferrous salt or the bisulphate of an alkali. Protosulphate of iron and protochloride of iron are salts having a weak base, which are inexpensive and may be used with advantage, while bisulphate of soda and bisulphate of potash are salts of stronger bases, which may be satisfactorily used when convenient.

In practically applying my invention, the quantity of the salt to be used in each case will depend on and should be at least chemically equivalent to the quantity of oxides or carbonates of the earth metals present in the ore, as ascertained or estimated in any convenient way. As an example, if a carbonate of lime is present, but no other alkaline earth in a particular ore, to the extent of, say, ten pounds for every thousand of the ore, then if a solution of a bisulphate of soda be used it should contain about twelve pounds of the solid salt. For another example, if the ten pounds of earth were carbonate of magnesia, then about fourteen and one-fourth pounds of the solid bisulpbate would be required.

The salt used will form with the oxides or carbonates of the earth metals either soluble compounds, which may be separated by lixiviation or washing, or insoluble compounds which are inert. If soda or potash is the base of the salt used, it can also be separated by lixiviation or washing. If a salt of iron is used, ferrous oxide or carbonate will be formed and will be precipitated in an insoluble condition, and, if found necessary or convenient, it may be separated by elutriation.

If carbonate of magnesia be present and the ore be treated with bisulphate of an alkali, a soluble compound of a sulphate of magnesia will be formed, and this may be separated by lixiviation.

I claim as my invention—

The process herein described of treating ores containing oxides or carbonates of earth metals, said process consisting in first subjecting such ores to the action of a proportionate quantity of a solution of ferrous salt or a bisulphate of an alkali to combine with the oxides or carbonates of earth metals, and then treating the ores with an acid or salt to obtain the contained metals, all substantially as described. JOHN S. MACARTHUR.

Witnesses: Edmund Hunt, David Ferguson.

The Simpson Patent Process.

PROCESS OF EXTRACTING GOLD, SILVER AND COPPER FROM THEIR ORES.—Jerome W. Simpson, Newark, N. J. Filed Oct. 20, 1884. Dated July 28,1885. No. 323,222.

To all whom it may concern: Be it known that I, Jerome W. Simpson, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful improvements in Processes of Extracting Gold, Silver and Copper from their Ores; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to extract certain metals from their ores more effectually and at a reduced cost; and it consists in the processes hereinafter set forth, and finally embodied in the clauses of the claims.

To carry my invention into effect, I first grind or crush the ore containing the metal to be extracted to a powder of more or less fineness. This powder is then treated with certain salts in solution adapted to combine chemically with the metal in said ore and form therewith a soluble salt. After thorough agitation, to mix the solution with the ore, the mixture is allowed to stand until the solid matter is settled and the solution has become clear. I then suspend a piece or plate of zinc therein, which causes the metal dissolved in the salt solution to be precipitated thereon, from which it can be removed by scraping or by dissolving the zinc in sulphuric or hydrochloric acid. The precipitated metal may then be melted into a button.

The salt solution I use for dissolving the metal from the ore is composed of one pound of cyanide of potassium, one ounce carbonate of ammonia, one-half ounce chloride of sodium, and sixteen quarts of water, or other quantities in about the same proportions.

This solution is particularly adapted for ores containing gold, silver and copper in the form of sulphurets.

For an ore containing gold and copper only I use cyanide of potassium and carbonate of ammonia about in the proportions named.

For ores rich in silver I employ a proportionately larger quantity of chloride of sodium.

I am aware that cyanide of potassium, when used in connection with an electric current, has been used for dissolving metals, and also that zinc has been employed as a precipitant, and the use of these I do not wish to be understood as claiming, broadly.

I am also aware that carbonate of ammonia has been employed for dissolving such metals as are soluble in a solution thereof, and the use of this I do not claim; but what I claim as new is:

1. The process of separating gold and silver from their ores, which consists in subjecting the ore to the action of a solution of cyanide of potassium and carbonate of ammonia, and subsequently precipitating the dissolved metal, substantially as set forth.

2. The process ot separating metals from their ores, to wit: subjecting the ore to the action of a solution of cyanide of potassium, carbonate of ammonia, and chloride of sodium, and subsequently precipitating the dissolved metals.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of October, 1884.

JEROME W. SIMPSON.

Witnesses: Oliver Drake, Charles H. Pell.

THE Denver MacArthur-Forrest Co. make a charge of $10 per ton on all ore treated. The Secretary of the company says: "We cannot profitably conduct a custom mill in this city in competition with the extensive smelting plants that make Denver the greatest mining and milling center in the world. These smelter plants treat hundreds of tons of ore per day, and one, the Grant, is increasing its plant to treat 750 tons per day. They purchase such ores and tailings as we could successfully treat at a very low figure, in order to obtain them to use in fluxing other ores. They charge as low as $3 per ton for treating such ores, and in many instances, owing to market conditions, they have treated iron pyritions ores for nothing. We mean by this that they have paid the full assay value for the ores that they desired for fluxing purposes."

CYANIDE SUPPLY.—The Gold and Silver Extraction Co. of Denver, in its circular, has the following to say concerning the cyanide supply: We have given the question of cyanide supply very close attention. We opened up a very extensive correspondence with various chemical manufacturing companies in the United States. After much interchange of expression, we succeeded in making a satisfactory arrangement for a large and continuous supply of cyanide from one of the largest chemical manufacturing firms in this country, who control the cyanide and prussiate supply of the United States. They stand ready to supply orders promptly from tonnage up to carload lots. They promise to keep an abundant supply on hand to meet all requirements.

THE WINNIFRED DISTRICT.—A *Herald* reporter visited the Union mine yesterday for the purpose of seeing the cyanide process in actual operation, and was more than satisfied with the result. At present it is being worked on some low-grade tailings which do not average over $6 per ton, and even at this rate it is making money for the owners. Mr. J. C. Rankin says he will start up the mill the latter part of this week, and will have the entire plant in active operation. He is now engaging miners, and will have ten stamps dropping steadily in a short time.—Phœnix (A. T.) Herald, June 15th.

Long Distance Electric Power Transmission.

The most important electric power transmission plant yet undertaken in this country is one now in course of construction for the San Antonio Electric Light and Power Co. in Southern California. The power plant is located in the San Antonio canyon, where there is a minimum flow of 1300 cubic feet of water per minute, affording a head of about 400 feet.

The water is brought to the power station through 1900 feet of 30-inch and 600 feet of 24-inch double-riveted sheet iron pipe, which involves a loss of head by friction of 12 feet, leaving 390 feet effective head or running pressure. The laying of the pipe line necessitated a rock tunnel 1300 feet in length as well as several heavy open cuts. The power station is provided with four double-nozzle Pelton wheels 34 inches in in diameter, coupled direct to the armature shafts of as many Westinghouse alternating current generators of 200 horse power each. The wheels will run under above conditions 600 revolutions per minute, giving the same speed to the generators. Two exciters are provided, which are also run by Pelton wheels coupled to the shafts in the same manner, of 20 horse power each.

By means of transformers the potential will be raised to 10,000 volts, and the current at this pressure will be conveyed over bare hard-drawn copper wires to Pomona, a distance of 13 miles, and to San Bernardino, a distance of 23 miles, and is to be used for both light and power purposes.

This work is attracting much attention, more on account of the length of the circuit than of capacity, it being a longer distance than has heretofore been attempted in this country. There is, however, no occasion for any misgiving as to results, either from a practical or mechanical standpoint. So far as relates to the utilization of the water power and its electric transmission by means proposed, the reputation of the parties supplying the machinery is a guaranty of the success of any enterprise with which they may be connected.

"CYANIDE IS KING."

NEW MINING ERA.

OLD AND ABANDONED MINES CAN BE PROFITABLY WORKED

BY THE

MacArthur-Forrest Process

CONTROLLED BY

THE GOLD AND SILVER EXTRACTION MINING AND MILLING CO.

CAPITAL STOCK, $5,000,000. — 50,000 Shares, Par Value $100 Each; Full Paid and Non-Assessable.

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COLONEL T. L. WISWALL, General Manager and Secretary.
P. GEORGE GOW, Manager Technical Department and Assistant Treasurer.
WM. L. COOPER, Engineer.

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HON. H. A. W. TABOR, Capitalist, Proprietor Tabor Grand Opera House.....Denver, Colo.
LEONARD GOW, Merchant, Ship Owner, and President Cassel Gold Extracting Co. (Limited).....London, England, and Glasgow, Scotland
PETER McCOURT, Treasurer Tabor Investment Co., Manager Tabor Grand Opera House and Silver Circuit.....Denver, Colo.
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THE MOST WONDERFUL PROCESS EVER DISCOVERED.

CHEAP, SIMPLE, EFFECTIVE. TITLE PERFECT—PROTECTION GUARANTEED.

Patents have been Granted in the following Countries, viz:

United States, No. 418,137, dated December 24, 1889; No. 403,202, May 14, 1889; and No. 418,138, December 24, 1889. England, No. 14,174, dated Oct. 19, 1887; in Cape of Good Hope, Africa, No. 6,101, dated Jan. 7, 1888; in Victoria, No. 5,572, dated Jan. 19, 1888; in New South Wales, No. 453, dated Jan. 21, 1888; in South Australia, No. 948, dated Jan. 23, 1888; in Tasmania, No. 529, dated Jan. 24, 1888; in New Zealand, No. 2,775, dated Feb. 1, 1888; in Canada, No. 28,471, dated Feb. 6, 1888; in France, No. 189,808, dated April 6, 1888; in Belgium, No. 82,673, dated July 24, 1888; in Brazil, No. 619, dated Aug. 23, 1888; in Portugal, No. 1,272, dated Aug. 30, 1888; in Italy, No. 23,852, dated Sept. 30, 1888; and in Spain, No. 8,533, dated October 2, 1888; also in Mexico, Germany and South American Republics. They control the Simpson patents, only granted in the United States.

HUNDREDS OF TESTIMONIAL LETTERS ON FILE.

Here are a few Sample Ones:

"I believe that I shall use the process extensively, and that it is the greatest revolution of the age and will "make the world $1,000,000,000 richer in the next ten to fifteen years."—A. H. JOCELYN, Editor *Daily Financial News and Record*, New York City.

"The cyanide process is making a gradual but steady advance both in practical results and favor."—*Engineering Magazine* of New York City for June, 1892.

"No metallurgical improvements of late years have attracted as much attention from the mining public as "the MacArthur-Forrest process, known also as the 'cyanide process.'"—*Mining and Scientific Press* of San Francisco, Cal., May 28, 1892.

"The Denver Mill is kept running night and day. The method is quite simple and easily understood. It is "most successful with free-milling and pyritious ores; tellurides, arsenical and silicious, both gold and silver, "manganese and some others."—*Mining Age*, Denver, Salt Lake City and San Francisco, June 11, 1892.

"Rest assured I am satisfied with the value of the process."—THOMAS JORDAN, Editor *Financial and Mining Record*, New York City, June 15, 1892.

"There can no longer be questioned the value of the MacArthur-Forrest process. It has proven its value by "practical demonstration."—*Colorado Graphic*, Feb. 13, 1892.

"Mining men all over the country are beginning to realize the marvelous possibilities of the cyanide process "for the extraction of gold and silver—technically known as the MacArthur-Forrest process. All over the West, "mills for the treatment of ores by this method are being erected, and practical miners are fast becoming alive to "the fact that in no other way can money be made so fast and so certainly as by thus treating their ore."—Denver *Daily Times*, March 16, 1892.

"During the past year the only process that has been demonstrated a complete success with the ores of this "county has been the MacArthur-Forrest process."—Boulder *Camera*, Jan. 1, 1892.

"The Livingstone people say that the MacArthur-Forrest process is a complete success on ore from that mine, "and the mill is running steadily night and day."—Boulder, Colo., *News*, Dec. 27, 1891.

"A new era in mining seems to be drawing upon this section. The process known as the MacArthur-Forrest "cyanide process bids fair to supercede all other methods."—*Arizona Journal Miner*, March 26, 1892.

"The last one hundred-ton cleanup at Calumet Mill, on the new cyanide process, is the most satisfactory yet "made, the returns being over 90 per cent of the value."—*Free Press*, Redding, Cal., April 2, 1892.

Speaking of operations in South Africa, *London Truth*, under date April 28, 1892, refers to the MacArthur-Forrest process as follows:

"Arrangements have been made for the treatment of the large reserve of tailings, exceeding 200,000 tons, by "means of the MacArthur-Forrest cyanide process, and the necessary plant will be erected during the early part "of 1892. The plant will be capable of treating from eight to twelve thousand tons per month, and from the "working of this they expected very profitable results. It is the biggest plant of the kind in the world."

"The African Gold Recovery Co. (Ltd) have received cable news that 13,500 ozs. of gold had been recovered at the Randt by the MacArthur-Forrest process during April."—Glasgow (Scotland) *Herald*, May 13, 1892.

"The wonderful success of all the new mills recently established in the gold fields of the West, which have "adopted the new process, is a sufficient guarantee that the MacArthur-Forrest process is the proper method for "the extraction of the precious minerals from ores in this locality. No other known method will do it so cheaply "and so thoroughly. While the old methods rarely save more than one-fourth or one-half of the gold and silver, "the new cyanide process will save from 90 to 93 per cent of all the ore contains. Practical miners and capitalists "are purchasing rights and erecting plants all over the land."—*California Farmer, Miner and Oil Reporter*, Los Angeles, May 28, 1892.

"The owners of these (MacArthur-Forrest) rights for the United States, however, do not set up the claim that "this method of treatment is adapted or adaptable to all varieties of ores. They invite every one to make a rigid "examination of the mill and of all tests from the beginning to the end. There are no secrets, no concealments. "They will not permit its use in the reduction of ores until its adaptability to them has been fully and satisfactorily demonstrated."—*Mining Age*, Denver, Salt Lake and San Francisco, June 11, 1892.

"S. B. Milner, President of the Gold Extracting Co. of Bingham, came in last night. He is in excellent spirits "over the results of the trial run of their new mill, using the cyanide process of ore reduction, which, he says, "demonstrates the fact that the enterprise will prove an overwhelming success."—Salt Lake *Journal*, May 28, 1892.

"The Gold and Silver Extraction M. and M. Co. is making very rapid strides indeed, and have reason to feel "proud of the success they are achieving."—*Daily Mining Exchange Journal*, Feb. 12, 1892.

The Mercur Gold Mining Co., at Fairfield, Utah, is working 50 tons per day. We quote the following extract from a letter written by Mr. Gill S. Peyton, Manager, dated April 19th:

"Comparative results by actual experience on our ore by amalgamation and the MacArthur-Forrest process are as follows:

"Fifteen hundred tons of ore treated by amalgamation gave an average extraction of 20 per cent at a cost of "$4.25 per ton for milling. Sixteen hundred tons of ore treated the past 90 days by the MacArthur-Forrest "process, average extraction of 88 5-10 per cent at a cost per ton of $2.25 for milling.

"Our appreciation of the process is fully demonstrated by the fact that during the month of March we increased our capacity, as before stated, to 50 tons per day. The last 16 days I have made over 100 tests on refractory low-grade gold and silver ores from different parts of the county, and my experience so far has been that "the greater number of them can be worked to a high percentage by the MacArthur-Forrest process."

MILLS IN OPERATION AS FOLLOWS, VIZ.:

CALUMET GOLD MINING CO.....Middle Creek, Shasta Co., Cal.
THE SHASTA GOLD EXTRACTING CO.....Middle Creek, Shasta Co., Cal.
THE MERCUR GOLD MINING CO.....Fairfield, Utah
THE BINGHAM GOLD EXTRACTING CO.....Bingham, Utah
THE NEEDLES REDUCTION CO.....Needles, San Bernardino Co., Cal.
THE PACIFIC GOLD AND SILVER EXTRACTION CO.....Oro Grande, San Bernardino Co., Cal.
THE ORA BELLA GOLD MINING CO.....Yavapai Co., Arizona
THE CROWNED KING AND LAST CHANCE MINES.....Yavapai Co., Arizona
TAE UNION MINE.....Maricopa Co., Arizona
THE REVENUE GOLD MINING CO.....Revenue, via Norrie, Madison Co., Mont.
THE IDAHO GOLD EXTRACTING CO.....Quartzburg, Idaho
AND OTHERS IN COURSE OF ERECTION.

THE OBJECT OF THIS COMPANY IS TO INTRODUCE THE MacARTHUR-FORREST PROCESS.

They have purchased from the Cassel Gold Extracting Company, of Glasgow, Scotland, the exclusive rights for the United States to use the patents covering the process.

If you desire an experimental test, communicate with the General Manager. If the results of a test are favorable, they will then make arrangements to treat a carload or more.

They are fully prepared to grant royalties to mine and mill owners, or rights covering districts and counties.

A few tubs especially constructed according to their diagrams, for triturating, settling, and filtering, is all that is required extra in connection with any kind of pulverizing stamps or rolls. The total cost, as a rule, does not exceed from $1.50 to $5.00 per ton.

The most desirable class of ores for this process are the so-called refractory gold and silver ores, pyrites, Hermatites, manganese, sulphides, sulphurets and tellurium. They have also treated successfully dry silver ores.

They will be pleased to answer all inquiries and furnish any desired information. Will supply descriptive literature on request.

P. O. BOX 926.

Address T. L. WISWALL, General Manager and Secretary.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

KEYSTONE.—Amsdor *Ledger*, June 25: The erection of the new hoist at the 1400-foot level at the Keystone is completed and hoisting from the winze has been commenced. The underground engineers are Chas. Berryman and Nick Gray. Sinking is going on rspidly with ths eight-hour system snd four men on a shift. John McLaughlin came down from Chichizola's mill yesterday snd reports that the mill started up ths beg nning of the week. About 16 hands are employed st present.

CLEAN-UP.—Clesning-up operations at the Grass Valley hydraulic claim were completed last week, and the hullion was shipped to San Francisco on Fridsy. This is the final clean-up, all the auriferous ground belonging to the compsny heing worked out. The yield is not definitely known on the outside. It is variously estimated between $15,000 and $20,000, which would make a very satisfactory sesson's run. Unless other ground csn be secured the company's work in this locality must cease. They have another claim, however, near Volcano, and it is probsble that the pipes and giants will bs removed to this claim. At the Bright mine they ars still waiting for timbers to enable them to proceed with sinking operstions. At ths Hsrdenhurgh it is ssid to be the intention of sinking 200 feet deeper. At the Clinton Consolidated at the 300-foot level the ore body is reported to he widening ont agsin, aud snother rich spot in ths ledge was struck a few dsys sgo. A hrsak or slip in the ledge was met with two weeks ago, which gave rise to the ides in ths minds of some that the ore body had pinched out. This impression, however, ws are plessed to say was entirely erroneous. The sulphurets works are running full hlast. Ths working force employed hy the company is 10 or 12 less thsn formerly, on account of the smployment of the mschine drills.

Butte.

BLUA LEAD MINES.—Oroville *Register*, June 23: Dr. Allen of Bangor was in town on Tuesday, and, speaking of ths blus lesd mines at that plsce, ssid everything was looking encoursging. The Cstskill Co. hsd a shsft down 142 feet, snd had rnn a tunnel about 100 feet from ths bottom of ths shaft. They had to hoist their pay dirt, pnmp water and force sir down a four-foot shaft, and thus worked under some dissdvantages. The bed of gravel wss about 20 feet in depth, and wss paying well. Ths chsnnel wss wide, and the bed promised to last for years. He heard it said that for the seven days' run, ending on Sunday, the compsny had clesned up $1500, but he could not tell whether this was true or not. The cement had to be blasted with gisnt powder and then run through an arrastre. The owners of ths Bishop mine hsd things about ready to strt up. They hsd new and good mschinery, and would work rspidly as soon as they hegun to raise dirt. They had steam power srrastres like the Catskill Co., hut owing to mors favorable conditions, he thought they would hs ahle to crush more cement per day to the man. Hsys & Clark have a good prospect, and will probshly get rich returns. They have struck the hlue lesd on Capt. J. W. Smith's land near ths Kentucky ranch, snd hsve run quite a cnt there by means of wster brought from the North Honcut. Dr. Allen is convinced that these mines ars extensivs and permanent. There are nearly 50 men now employed, and a larger number will he added as new mines are opened and the present ones hsve greater facilities for getting out cement and crushing it.

El Dorado.

ELEVATOR.—Georgetown *Gazette*: The hydraulic elevator at Mammoth Bsr, under msusgement of Col. Davis, started up lsst Sstnrday. John C. Rich of Georgetown, ths veteran miner aud mine superintendent, has resumed his old position on the miue.

Kern.

THE NEW SILVEE MINES.—Bakersfield *Californian*, June 25: The veins that srs heing opened in Agua Caliente district hy Andy Sauser, still continue very rich. Samples thst he recently sent to Los Angeles, returned an assay value of $2300 per ton. He has recently sold two of these mines to Los Angeles capitalists, who are greatly pleased with their bargain. Quite a number of mining men are examining the ne silver region, and thus far all report in the very highest terms concerning it. From arrangements recently made it seems likely that two new mills will shortly he erected in that locality.

Lassen.

A RICH STEIKA REPOETEN.—Lassen *Mail*, June 25: It is reported that a rich striks was made last Saturday in the quartz mine belonging to Wm. Long and others, who have heen running tunnels and prospecting for a long time on Diamond mountain, about five miles south of Susanville. From the meagre information thus far obtained, it appears that a ledgs soms three feet thick has been struck, one foot of which is literally filled with gold, visihle to the naked eye, while the remaining portion is very rich. Outside of this they have an immense ledge which assays largely in gold aud silver.

Los Angeles.

SAN GABEIEL CANYON MINAS.—Covina *Argus*, June 25: The placer mines of the San Gabriel are yielding good pay for the intelligent labor hestowed upon them, and a gentleman who knows says that if they were this side of the mountains the hill would all he washed away in a short time. The Kelsey M. Co., located five miles up the river, is shipping another carload of exceedingly rich ore. It is reported that a carload of similar ore sent away last month yielded returns of near $65,000.

Mono.

BONIE CON.—*Miner*, June 25: Esst crosscut No. 1, 550-foot level, wss extended 6 feet. North drift from shove crosscut wss extended 9 feet. We started an npraise on a 6-inch sesm of ore from above drift. Upraise, 400-foot level, was extended 6 feet. The ore in fsce is from 6 to 8 inches, of f. ir milling.

MONO.—During the past week ws made ths air connection with No. 1 npraise, 60 feet above the 600-foot level, and extended the ssme 7 fest.

Nevada.

THE YELLOW DIAMONN.—Nevada *Herald*, Jnne 23: The formation in the Yellow Dismond shsft is now eight feet wide, and the owners expect to get a good ledge. A pump bss beeu put into the shaft, and a light hoisting rig is being huilt at the Nevads Foundry. Water power hss heen brought in, and two Pelton wheels will he set up—one for ths pump and one for the hoist. Two shifts are working, and ths shaft is going down rapidly.

DEIFT GRAVEL MINING.—Grass Valley *Tidings*, June 25: Interest in this branch of mining has grestly revived since ths profitable channel in ths Harmony and West Hsrmony mines near Nevads City was cut. Ths gravel yields from $10 to $13 hy mill process, and both mines are to havs ten-stamp mills put on thsm at once. W. W. Stow and B. J. Watson are so pleased with their success in the West Harmony that they have arranged with M. L. Marsh to open up a tract of ground owned by him, and situated on the same ridge hut a mile farther east. It is believed the same channel will he cut there. Mr. Marsh, by the wsy, is to be credited with much of the honor attaching to the development of this profitahle channel, as he, almost unsided, opened ths Harmony.

OELEANS MINA.—Grass Valley *Telegraph*, Juue 25: The Orleans mine, of which Ambross Powning is superintendent, has its hoisting and pumping works all completed, snd a start-up has been made. Everything works well. Sinking in ths mine hss been beguu. It is expected that the valushle Rush and Laton ground will soon he reached. The Orleans is now taking ors from the winze, and a crushing will soon he had. Several crushings heretofore made hsve turned out in a way to justify all ths expenditures contemplated.

Plumas.

BIO NUOOET.—Plumas Co. *Bulletin*, Juns 23: Last week, Hewitt Bros., in the old Gould & Spencer mins near Gibsonvills, found a largs boulder of gold with some quartz mixed in it. It is somewhat ohlong in shsps and weighs 22 pounds, and is estimated to contaiu between $1200 and $1500 in gold. This spot seems prolific of such nuggets. About 15 years ago, J. E. Perry, our informsnt, says a similar nugget worth $1500 wss found. Flattering reports come to hand with referencs to the prospects in the Roedds & Stampfli mine near Soda Bar.

San Bernardino.

SILVEE REAF DISTEICT.—Los Angeles *Express*, June 24: S. S. Nowlin, secretary of the Riverside Silver Development Co., was in Los Angeles yesterday with some specially encoursging news. Ths compsny was incorporated last December, W. A. Hayt president, with $1,000,000 capital, and ths stock hss steadily raised from 20 cents on the dollar to psr. The shaft in the Silver Reef district iu Ssu Bernardino county is now more than 100 feet deep. There are several tunnels from 60 to 70 feet deep, all developing ors of high grade, some of it running as high ss $600 to ths ton. A ten-foot vein of the $500 ore has been found. John S. Reece is superintending the mine and developiog it as fast as possible. The old Msssadonia mine, so well known 30 yesrs ago, was supposed to have been found a few weeks ago, and late news verifies the statement, for the old shaft has now been located, although there was little trace of it, ss it was so nearly filled np. The shaft has now been cleaned out and found to be only 40 feet deep aud a drift of teu feet running off from tie shaft, revealing a body of vsry rich ors, snd still not through the vein. The men 30 yesrs ago were all either killed or driven away by Indians, and their old tools were fouud last week in the bottom of the old shaft.

Sonoma.

PEOSPECTINO.—*Calistogian* June 23: Miners are prospecting a clsim west of Healdsburg which will probahly result in loss to the persons who furnish the money. The drift toward the ledge has been extended 200 feet, aud it is expected that the ore vein will soon be cut. The assays of surface rock show that it contains, to the ton, 25 cents in silver and $5.17 in gold.

Tuolumne.

NOTES.—*Independent*, June 25: It was J. D. Sullick who found the bnnch of gold in Wolfling's land, aud the amount was 74 ounces. J. E. Donohue, the popular superintendent of the Buchanan mine, was in town last Saturday. Some very rich ore has recently heen strnck at the Buchanan, and it is being worked thoronghly and systematically. Gus. Wedekind, who has been miuing under the lava ou Engelke's Gulch, receutly ran a uew drift and got into pay gravel. He is now taking out about $8 a day, with a good prospect for something hetter. Gale and Lawson have been driving an air shaft in their pocket-mine at Thompson's Hill. They are now about ready to commence work on the veiu. This mine has already furnished several pockets, and Gale and Lawson will no douht be able to locate one. In the article copied last week it was stated that the Bonanza mine was owned by Olivsr, Johnson & Kelley. This was an error. The property is owned hy M. B. Harriman, E. Keil, D. Oliver, A. P. Johnson aud Bsit Divoll. Mr. Divoll's interest is lessed hy the parties first named. Charley Smith and Johu Ferguson have secured a lease of a portiou of L. R. Peterson's pocket mine on the summit of Yankes Hill. A great mauy thousands of dollars have already been taken from this miue. Ths vein was discovered iu early days, by miners who were placering. They followed the float gold right np to the vein, getting nuggets ss big as $500. The vein has been owned by ssven or eight different parties. Abont ths time one party concludes it is worked out, another comes along and gets a pocket out of it. Smith and Fergnson have two men at work, aud expect to find something shortly, the indicatious being very good.

Trinity.

WORK RESUMAU.—Trinity *Journal*, Juns 28: James A. Johnston is about to open np ths Bullychoop property again. He is getting a bond on the entire mine that he is interested in, and will begin work as soon as practicshls. He will extend the present tunnel some distance farther and cut the ledge if it is there.

CANON CBAAK.—Ths mines in this camp are looking quite encouraging. The Chloride Co. has opened np a new pay chuts, ths Bailey meu have struck some $100 rock, and the Msple is putting up an arrastrs to crush six tons a day. The mines in this section never, as a whole, looked more prosperous. C. C. Shattuck is running a tunnel to tap ths Buck's Rauch ledge at a lower level, where he sxpscts to find good ore.

NEW RIVEE.—Cor. Weaverville *Journal*, Juue 25: The mines are about the same. On ths Sherwood mine, Leas & Nicholson made a clean-np of a small run, ths other day, of ovsr $2000. Miller & Stone are now making a rnn from the same mins of about 75 tons that will go over $50 to the ton.

NEVADA.

Washoe District.

CONS. CAL. ANU VIAGINIA. — *Chronicle*, June 25: There has been extracted from all parts of the mine, during the week, 998 420-2000 tons of ors which was shipped to the Morgan mill, the average value of which, per csr sample, was $25.95 per tou. The avsrage assay vslne of all the ore worked at that mill during the week, 980 tons, was $23.41 per ton, per battery samples. Thsre was worked at the Vivian mill during the week 230 tons of ore, the aversge assay value of which, per battery samples, was $18.68 per ton. Bullion shipped to Carsou Mint, assay valne, $17,034.22. Bullion shipped to the company's office iu San Francisco, assay vslue, $1534.98.

MEXICAN.—On the 1465 level, ths drift running north from ths crosscut run east from the hottom of the winze snnk 101 feet below the sill floor of this level, near ths sonth honndary of the mine, at a point 40 feet esst from the winze, has been advanced 20 feet; total length 101 feet; continuiug in a porphyry formation, showing fine lines of qnartz and soms clsy.

UTAH.—The west crosscut No. 1 from ths north drift, 1340 level, from ths west crosscut from the shaft station, has a total lsngth of 120 feet; cutting through clay and quartz of very low assay valne. Resnmed work in the uorth drift, startiug at a poiut 267 feet from ths main west drift; it has been sxtended a total length of 301 feet; formation continues in porphyry, with small stresks of quartz.

SIAERA NEVAUA.—Sincs last report we have suspended work in west crosscnt No. 1, which was advanced 40 feet; fscs in porphyry and streaks of quartz.

GOULU & CUREY.—On ths Sntro tnnnel level, ths joint npraise with the Ssvage Company has heeu carried up a distancs of 15 fest during the week; total height 110 feet; face in porphyry and stringers of quartz.

HALE & NOECROSS.—Have men on repsirs in ths msin shaft and at other points in the mine where necessary. Of the ore remaiuing in the ore house at the time we ceased sxtraction, tbers has been shipped to ths Brnnswick mill 416 850-2000 tons; average railroad car samples of same, $16.72. This ore has remained in the ore house for a very long time. To-morrow's shipment will clean ont the ore house complstely. Aversge hsttery assay for the week, $12.70. No returns have been received of the hullion seut to the U. S. Mint at Csrson last week, ss ths Mint is making its annual cleanup.

POTOSI.—We have extracted and ssnt to ths mill in the past week 495 1100-2000 tons of ore from the 930, 1000, 1100, 1150 and 1200 lsvels. Milled during ths week 455 tons. On hand at mill, 120½ tons; average battery assay, $22.08; averags car sample assay, $26.09. Sent to the Carson Mint 397 pounds of crude bullion.

BULLION.—The joint Potosi wiuze is down 402 feet helow the 1500 level; bottom in low-grade quartz. The south drift, 1500 level, is out 547 feet sonth of north line; face in porphyry.

OCCIDANTAL.—Have extracted from the 350, 400 and 450 levels 180 tons of ore of the average value of $26 71 as per car samples. Milled dnring the week 182 tons of the average value of $23.10 as per hattsry samples. The Zadig drift from the Sutro tunnel has beeu extended 23 feet; total, 661 fest.

Columbus District.

WOEK TO EE RESUMED.—Walker Lake *Bulletin*, Juue 23: Supt. Shockley of the Mt. Diablo company advertises for 50 miners to work in the Mt. Diablo mine; wages $3 per day. Work will be resumsd in the mine on or about the 1st of July. Captain Fleming, foreman of the company's mill at Sodaville, put some men to work on Saturday. The mill will be in readiness to drop stamps in a week. There is a general rejoicing in all parts of ths county on acconut of the resumption of work in the Diablo, and it is the general hope and belief that the Holmes compsny will resume work very soon. Snperintendents Jackson and Shockley are expected daily from California.

Tuscarora District.

NAVAJO.—*Times-Review*, June 24: North intermediate drift above the 350 foot level has heen exteuded 15 feet aud is still showing some good ore in ths fsce.

BELLE ISLE.—West crosscnt, 250 foot levsl, extended six feet, cutting a small vein giving good assays. South drift, same level, extended 10 feet, showing spots of good ore. Upraise on the east vein, 350 foot levsl, extended 12 feet, with no change.

ARIZONA.

HILLSIUE.—*Journal-Miner*, June 25: The new owners of the Hillsids mins are pushing work actively on the property. Col. A. O. Brodie has been employed by the compauy to put in quite a large dam to stors water for the use nf the company. Ths Old Relishle mine is heing worked hy a largs forcs of men under ths foremanship of Ed. Zimmermsn, a thorongh and competent miner. Thsy are developing the mine and taking ont rich ore on the lower lsvel. There is from 16 inches to 2 feet of ore, assaying from $25 to $50 per ton. Ths mill is kept runniug day and night on ors that is being taken out, the ors being free-milling gold ore.

COLORADO.

MINARS' WAGES.—*Mining and Scientific Review*, June 25: The reduction of miners' wsges throughout ths Red mountsin minss amonnts to about 33⅓ cents a day. The cut seems to have heen necessitated by ths increased cost of miuing, the low price of silver and higher transportation charges than any other section pays.

HILL TOP DISTRICT, uow called Dolomite, is occupied by miners from Aspen and Leadvills, who expect to develop some extensive deposits of carhonate ore, rich in silver. Not much beyond assessment work has yet hesn done. The formatiou and the ors seem to he almost identical with the main features of Aspen mountsin. If it shall provs to hs a largs and good field, hoth the Midland and South Park rsilroads could huild hranches at very little tronhle aud expeuse. Ths camp is wsll situated iu the Sonth Psrk and within easy distance of Pueblo, Denver and Leadville.

IDAHO.

DEVELOPMENT WORK.— *World*, June 20: Work has begun on ths shaft on the Bella location ou Crooked creek, in Beaver district. Matt Graham received the contract to sink 200 feet. This is one of the locations for the development of which John Henry has secured Eastern capital. Work has commenced on another shaft on a new location—ths Edna—located by Mr. Heury, and is about half a mils from ths Bella. This ledge is 60 feet wide, with rich stringers of silver ore through it. This shaft will be sunk 50 or 100 feet, and if ths showing at that depth will justify mors extensive development, a tnnnel will hs run to cut ths ledge at the depth of 300 feet. The tuunel will hs four or five hundred feet in length. This is one of the strongest ledges in the county, and carries ore that will run 1000 ounces silver per ton. If, with dsvelopment, it proves to bs as good as expectations pictnrs it, ou the strength of surfsce showings and cropping promises, such as seldom fail, ths Edna will develop into ons of the hig bonanzss of the State. The croppings are much better thau thoss of the DeLsmar, now unsurpassed by any mine in the world, aud its sizs almost equals the immense proportions of that famous mine.

OREGON.

NEW MINE AT OSWAOO.—Oregon City *Enterprise*, June 26: Ths Oregon Iron & Steel Co. is dsveloping a new iron mins on its property uear Oswego. This mins hss a five-foot vein of black magnetic iron ors that assays from 50 to 65 per cent metallic iron—shout douhle the richness of the old hematite mine and of ths kind needed in the smelting business in ordsr to mske the product what it should he. It has been necessary heretofore to import all the magnetic ore used. The new mine is on the south sids of the track and is shout a third of a mile uearer ths smelter than the old mines. It is nearly on a level with the railrosd track, and uot more than 100 yards from it.

WASHINGTON.

SWAUK MINES.—Cor. *Capital*, Jnne 25: Never in ths history of the camp has so much work beeu in progress as is going on now. One good featnre is that it is not all prospecting. Many of the miners stayed by their claims all winter getting them ready for active operations, and the result is that there are more producsrs now than ever hefore, and the returns are generally satisfactory. Water is still plentiful, and it bids fair to hnld out well. The cleanup of 145 ounces of gold hy Peterson and Tweet, valned at $2320, has heen mentioned. They are at work on another cleanup. York, who has 13 tons of rock on his dump, will finish his clean-up about the 1st of July; and judging by looks, he will secure at least $1300, and perhaps more. The Gold Leaf finished cleaning up lsst Saturday, and the rock averaged $39.50 per ton in free gold. Virden is keeping one stamp busy on his claim, and is cleaning up abont $10 a day. B. C. Pitcher is still piping on the old Black claim and expects to keep at it as long as the water lasts. Ben Hanson has struck a fins prospect on Boulder creek, which shows a ledge over 5½ feet wide, carrying free gold. Tacoma parties now have a hond on the property. The Spokane Co. has just cleaned np abont 40 ounces on a 20 days' hydraulic run. Work is being pushed on the Bnckhorn, which is considered by many the finest property in the camp. A force of men is at work sinking a shaft on the vein which is seven feet wide between the finest kind of walls, and it carries free gold, scarcely a hncket full coming out in which some of the precions metal caunot be seeu.

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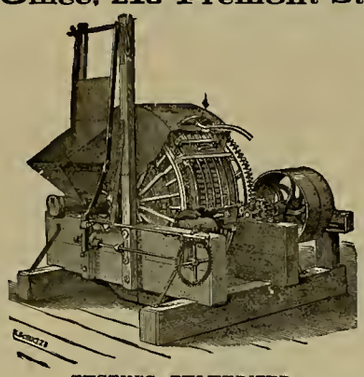

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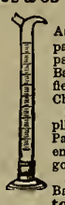

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MECHANICAL PROGRESS.

Galvanized Iron.

HOW THE IRON IS PREPARED AND COATED.

To many not familiar with the subject, says the *Manufacturers' Gazette*, the name given to iron which has been coated with tin or zinc is misleading, as there is no galvanic process employed, the iron simply being coated by a dipping process.

Although the process of galvanizing iron to prevent rusting is practiced on a very extensive scale, no radical changes have been made in the method by which it is done.

A French chemist states that a plan or process of coating iron with zinc was known and practiced as far back as 1742, and the fact is further established in a paper upon the subject contained in Bishop Watson's Chemical Essay, published in 1786, describing the process, which is practically the same as that in use at the present time.

Several patents have been secured for a galvanizing process. The first of these was granted to H. W. Craufurd, an Englishman, in 1837.

The process employed by Craufurd was as follows: The iron is first subjected to a pickling process, to remove all scale or rust, the iron being immersed in a dilute solution of sulphuric or hydrochloric acid, either hot or cold, preference being in favor of the heated bath.

After remaining in the acid bath sufficiently long to remove all foreign matter, the iron is removed and thoroughly rinsed in cold water, scoured with sand, and again rinsed.

It is then ready for the coating and is placed in a zinc bath, which is prepared by melting zinc coated with a thick layer of dry sal ammoniac, the sal ammoniac being used to form a viscid coating, which prevents the molten metal from rapid oxidation.

Small articles are treated in the same way, but as they are found to be soldered together when taken from the zinc bath, it is necessary to put them through another process to separate them. They are placed in a cylinder or crucible with charcoal powder, and while subjected to a considerable heat are shaken and thus separated.

The purer the zinc the better the result. Mallett recommends an amalgam of zinc 2292, mercury 202, and about one of sodium or potassium. This melts at 680° F., and into this the iron is dipped, being removed when it reaches the temperature of the alloy.

As above stated, there has been very little progress made in the art and the process is practically the same to-day, except that different concerns have methods of their own for doing the work.

There is a chance for development in this line of depositing a coating, and now that electricity is being used so extensively in similar processes, it seems probable that it will be adapted to plating or coating iron with zinc, and even to the manufacture of tin plates.

Experiments have been made in this direction, and the results justify the opinion that the old process will be improved upon and so simplified as to reduce considerably the expense.

We have seen iron pipes and plates coated with lead, tin and zinc by an electrical process similar to that used in copper or electroplating, and which for almost every use to which iron so coated is put is far superior to galvanized iron by the present process, besides being very much less expensive.

The Eastern Pig Iron Situation.

While for many months past, says *Iron Age*, sellers of relatively unknown brands of pig iron in the Eastern markets have been forced to make sacrifice sales again and again, the signs are accumulating that standard Northern brands will soon give way. A number of Pennsylvania furnacemen, realizing the gravity of the situation, have been tentatively discussing the chances of a closing down of a certain proportion of the blast furnaces making iron for the open market. We understand that the banking or blowing out of one-half of the stacks now active has been suggested. Thus far these proposals have not met with an enthusiastic reception. A good many difficulties stand in the way. Some of the plants are operating only one furnace, and they, of course, could not take half measures. Larger plants might put furnaces on the idle list, and yet drive the active ones a little faster. Then, too, concerted action on the part of the Pennsylvania stacks would only afford welcome relief to the producers in other sections. The Southern furnaces would direct increased tonnage into the markets of New England and the Eastern States and the effect of the threatened strike in the Western rolling mills would have less terror for the furnaces which supply that market. A certain quantity of pig iron which ordinarily would go to Western steel works might seek an outlet in the Eastern foundry and forge markets.

As a matter of fact, any prolonged stoppage of the Western mills would throw additional work on their Eastern competitors. In fact, consumers are even now beginning to discriminate in their favor. This must help the Eastern furnacemen to some extent.

The chances are, however, that the cutting in prices on standard brands will lead to a sharp reduction in the quotation of the leading producer, which will establish a lower basis on the highest class of Northern brands and will render it all the more difficult for other irons to find a sale in this territory.

One-sided Tests.

But very little credit is given now-a-days to one-sided tests of machinery and engineering appliances. Some of these tests are no doubt made for advertising purposes. Instances sometimes occur in which one party sets forth the results of, say, a boiler test, showing remarkable results—often beyond the limits of possibility. Then, not to be outdone, a rival makes a test that gives a little better results, and so it goes; but, as intimated, the public is becoming skeptical in such matters, and, of course, engineers give no credit to the published statements.

In many instances the tests may be made with every intention of honesty, and still be far from correct. There is not a shadow of doubt that it is the easiest thing in the world for a man to "fool himself" if he is an interested party.

In the test of anything about which there is so much complication, and so many chances for error as there is in the instance of steam engines and boilers, no one without considerable experience in making such tests, and who is absolutely without prejudice, is competent authority. The party who pays the coal bills may know how much coal is used in a month or in a year, and the indicated power developed may be pretty accurately determined without the exercise of a great deal of skill of a high character. And this is a very good test indeed of the entire plant. But when it comes to making tests to determine the possibility of economy in a few hours' run, obtaining, perhaps, the economy of boiler and engine separately, the question is quite another one; such tests will not now be accepted except upon undoubted authority, and the publication of anything less carries very little weight.—American Machinist.

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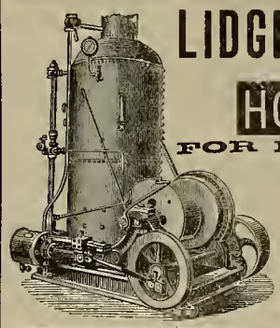

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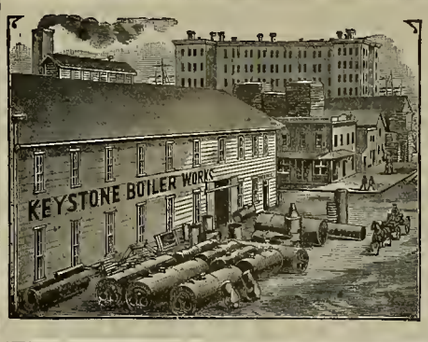

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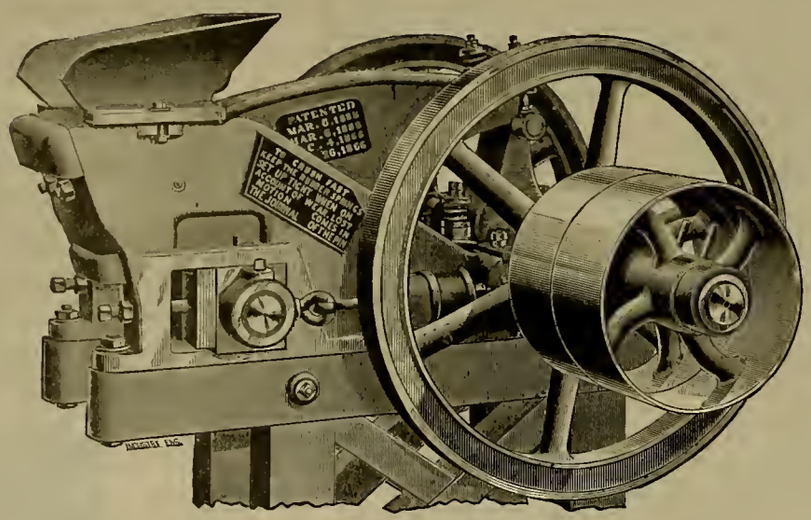

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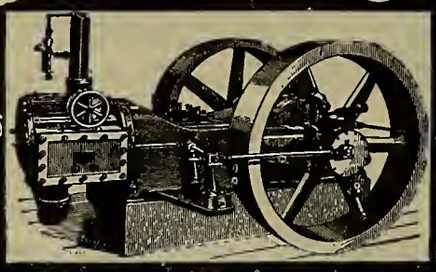

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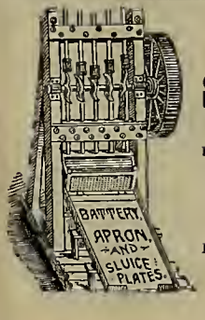

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SCIENTIFIC PROGRESS.

The Limits of High Potential Transmission.

In discussing the subject of the practical limits of high potentials for the transmission of power, a foreign contemporary quotes from some articles published in one of our recent issues, and calls attention to the fact that too much haste ought not to be made in predicting the possibities of the future in the use made of exceedingly high potentials. The author, presumably Mr. Hospitalier, claims that our present knowledge of the action of currents at high potentials is not sufficient to enable us to predict with certainty just how currents and insulators will behave at potentials far exceeding those with which experiments and actual trials have been made. In this he confirms our editorial comments of some weeks ago. He quotes Mascart and others as having shown that it is impossible to get such high potentials as 500,000 volts in air under ordinary conditions of temperature and pressure, no matter what the distance between the electrodes is. He states that according to Mascart the striking distance between two spheres 22 millimeters in diameter is nearly proportional to the voltage up to a distance of two centimeters, but that beyond this the voltage increases more slowly than the distance; for instance, at 10 centimeters it is 119,000 and at 15 ooly 127,800, an increase of only about seven per cent, although the distance is 50 per cent greater. From a continuation of the curve drawn through the results obtained, he deduces the fact that the limit in air tends toward a point probably within 150,000 volts, and this is the same for a few centimeters or for many kilometers. Although objections might be made to thus continue the curve, yet he thinks that up to striking distances of one meter the curves can be relied upon. He considers it absurd to talk of using potentials of two and three million volts on bare wires in the air, as such potentials would, according to Prof. Owens, of the Nebraska University, be capable of sparking around the world. He admits that much higher potentials can be used in oil than air, but states that it is by no means certain that oil, as an insulator, has all the advaotages that have been attributed to it somewhat prematurely; it appears to offer much more disruptive resistance to alternating currents of the frequency of 100 to 150 volts, than to those of greater frequency, being almost the same as in air. He thinks that 40,000 to 50,000 volts is the extreme limit possible to-day for transmission to great distances. Beyond these figures he claims that projects can exist only in fancy and on paper. We agree with him that high potential enthusiasts should he warned not to proceed too fast, hut add that in view of the present tendency in the direction of usiog high potentials, it would be very desirable to establish the limits more definitely by experiments.—Electrical World.

MODERN BULLETS.—Prof. Bardeleben has recently delivered an address in Berlin on the modern bullet (*British Medical Journal*, May 21st). The modern rifle sends a bullet with a narrow cylindrical form and poioted apex, which at a distance of 1000 meters has the power to pass through several human hodies or to disable two horses. Its line of flight differs but slightly from the line of sight. It has an inner core of lead inclosed in a casing of steel which prevents the lead from becoming deformed and spreading at the point of contact. This change is of much interest for military surgery. The hullet is lighter than any of the lead bullets, but is sent with a greater velocity. On account of its velocity and its small surface of contact, it merely punches out a hole, causing very little commotion of the neighboring parts. It is more likely to cause fatal hemorrhage than the old bullet. If the new bullet wounds at all, it will have sufficient power to pass through any part of the body. Col. Boonen-Rivera, in his report on the civil war in Chili—the only war in which Mannlicher rifles have been used—says that the numher of dead on the battle-field was four times larger thao that of the wounded. The effect of these bullets on bone has been made the subject of a series of experiments. Up to a distance of 400 meters the bone is invariably shattered, and at greater distances either clean perforations or oblique fractures result. In the next war the ratio of recoveries of those who can be removed still living from the field will he larger than formerly. The new projectile is by no means so humane as it is sometimes called, since within similar periods of time, and under equal conditions, it kills and wounds more men than the old bullet. But the wounds which it causes, if they are not of a directly fatal nature, open to the surgeon, as a general rule, a far more promising field for exercising his skill and activity than those which were caused by the old bullet.

A NEW USE FOR OIL AT SEA.—The use of oil as a means of reducing the friction on the sides of a ship, caused by the passage of the ship through the water, and thereby increasing her speed, has been suggested. The idea embraces many featnres that would seem feasible, but whether or not it would practically make any difference remains to be seen. The oil is fed in minute streams against the sides of the vessel by means of a series of perforated pipes, adjusted to the bow and extending from the keel to the water line, or higher. The progression of the craft passes the oil back toward the stern, and at the same time the inward pressure of the water prevents the oil leaving the sides of the vessel without doing its duty. Perhaps the oil might be more thoroughly distributed were the ship huilt with grooves along the sides. Another suggestion is to submit the oil to a chemical treatment, whereby it would prevent weeds and barnacles adhering to the vessel's bottom, and thus increasing the scope of the oil's duties.

CHEMISTRY OF THE SECONDARY CELL.—A lengthy pager, detailing some long investigations on secondary cells, was read a short time back, before the Institution of Electrical Engineers, by Messrs. Gladstone and Hibbert. The deduction which these gentlemen draw from their experiments is that the various changes in the electromotive force of the secondary cell are due mainly, if not entirely, to variations in the density of the acid around the plates duriog charge and discharge. They were led to make these investigations owing to a paper read by Dr. Armstrong and Mr. Robertson before the Royal Society last summer, in which these geotlemen attributed an important part of these variations in electromotive force to the presence in the electrolyte of hydrogen dioxide and persulphuric acid. In the discussion which followed the reading of papers, Mr. Robertson was able to point out several facts which did not fit Messrs. Gladstone and Hibbert's theory. But it must be confessed that the contest between these electro-chemists remains at present a drawn battle. Each side has damaged its opponent's case, but has not succeeded in proving its own conteotion.

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the seventh (7th) day of June, 1892, an assessment (No. 69) of Twenty-five (25) Cents per share was levied upon the capital stock of the corporation, payable immediately in United Sta'es gold coin, to the Secretary, at the office of the company, Room 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twelfth (12th) day of July, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 4th day of August, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Trustees

ALFRED K. DURBROW, Secretary.

Office—Room No. 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

THE BUTTE KING MINING COMPANY. LOCATION of principal place of business, San Francisco, Cal. Location of works, Butte County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of June, 1892, an assessment (No. 4) of five cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary, at the office of the Company, 723 Market St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 11th day of July, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 2d day of August, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors,

W. O. LEWIS, Secretary.

Office, 723 Market St., San Francisco, Cal.

TERIKOFF G. M. AND M. COMPANY. LOCATION of principal place of business, San Francisco, Cal. Location of works, Amador County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of May, 1892, an assessment (No. 8) of one cent per share was levied upon the Capital Stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary, at the office of the Company, 308 Pine St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1892, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Friday, the 29th day of July, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

W. J. GURNETT, Secretary.

Office, 308 Pine St., San Francisco, Cal.

JAMES M. HAVEN. THOMAS E. HAVEN, Notary Public.

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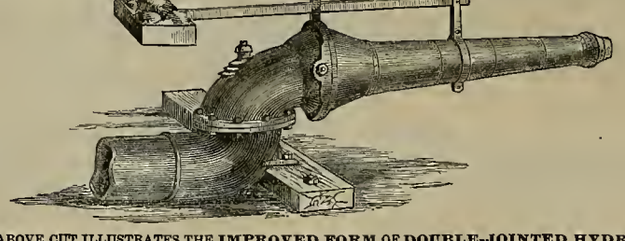

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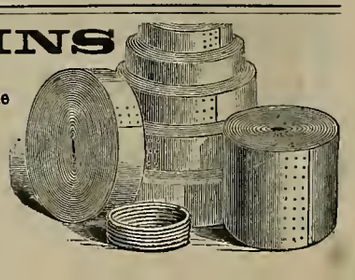

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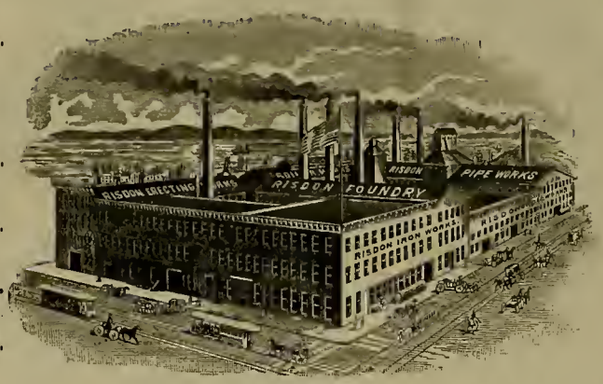

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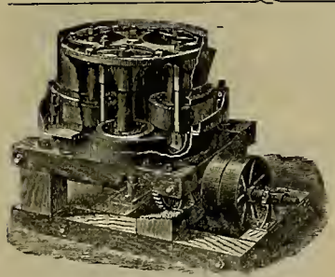

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ELECTRICITY.

Tunnel Lighting by Electricity.

The Batignolles tunnel, just outside the St. Lazare station of the Western Railway, in Paris, is to be lighted by electricity. It is said that it has frequently been proposed either to open up the tunnel or to light it efficiently, not only on account of the inconvenience to passengers, but also because recent events have proved that the tunnel constitutes a serious danger to the workmen upon the railway. The railway company has definitely decided to adopt the system of illumination invented by M. Brochon. Under this system 900 incandescent lamps will be disposed along the tunnel, 150 along each side of the three sections. They will be placed at a height of 15.75 feet above the rails, and each lamp will be inclosed in a strong sheet iron box, the light being thrown on the wall by means of a powerful reflector. This light will be received by plates of burnished tin, covered with glass, which will be placed at a height of 6.56 feet. These will in turn reflect a soft and agreeable light into the cars. In order to economize as much as possible, the lamps will be automatically lighted by the train, and only that part of the two walls directly opposite to the train will be at one time illuminated. But as sudden change from bright light to darkness would constitute a danger to the trackmen, it is proposed to place 20 lamps overhead in each section of the tunnel, and these will be kept permanently lighted. It is also intended to introduce a decidedly novel feature for the benefit of the passengers. Besides a limited number of advertisements, it is said that reading matter will be provided along each side of the tunnel. By an automatic process quotations on the Bourse, the latest news telegrams, winners of horse races, and other matters of interest will be displayed, and as the train slows down before entering the tunnel it is said to be easy for the passengers to read what is displayed. The work is now being proceeded with.—Engineering News.

THE FAURE PATENT IN GERMANY.—While in this country the litigation concerning the Faure patent has resulted in tying up both companies, the Germans, like the French, have acknowledged the rights of Faure. The Supreme Court of Appeals of Leipzig has just delivered a judgment confirming the decision of the German Patent Office concerning Faure's patent, and thereby establishes its validity. It will be remembered that a year or more ago a similar decision was reached in France. As we have so few accumulators here, the litigation in this country is of comparatively little interest, except in so far as it delays the development of the accumulator. It is a matter of no great concern, therefore, who is the winner here, if winner he may be called at all, but both in Germany and France the accumulator business is very large and prosperous, increasing continually. The accumulator there is a staple, reliable article of manufacture; here it is considered, like the electrical goods of the quack doctor, fit only for the ignorant and unsuspicious. But the accumulator when substantially made is a very convenient and useful accessory to an electric plant, even though many Americans think otherwise, and it is to be regretted very much that it has such a bad reputation here. As much of this is doubtless due to the lack of healthy competition, owing to the fear of a possible fundamental patent, it is to be hoped that a definite decision will soon be reached in this country too, in order that we may begin to make up for valuable time and reputation lost in this almost endless litigation.—Electric world.

TELEGRAPHIC INVENTIONS.—New inventions in applied telegraph are so frequent that the reader cannot keep up with them, says the Chicago *Journal of Commerce*. Here is a recent English improvement whereby three messages can be transmitted on one wire—the invention of Langdon Daviess. It is called the phonophore. Time has proved the value of the system, and it has been adopted by all the important railways in the country. The most recent development is the introduction of a system by which a telephone can be used on a wire which is being simultaneously taken up by a telegraph message. This discovery has been applied recently to the Great Western Railway Company's block line between Southall and Brentford, a distance of three and a half miles, and the telephone is working so well that the faintest sounds are heard even when a telegraphic message is being sent on the same wire.

QUICK WORK.—On the occasion of the recent Oxford-Cambridge boat race on the Thames, the London papers containing the result and full details of the race were on sale within four minutes after the Oxford crew had passed the winning post. The press boat, a it steamed up the Thames, paid out a cable consisting of a seven-strand conductor, insulated with vulcanized rubber warps and with braids of flax, which had been especially manufactured for the purpose. Over this cable the progress of the boats at intervals of a few minutes along the entire course was transmitted to the papers and published all over London almost as the crews were passing the point indicated. Immediately following the result there was dispatched a complete description of the race from start to finish, which was in the hands of the newspapers and others provided with the instruments of the Exchange Telegraph Company long before a single newspaper man was able to land his "copy" from the press boat at Mortlake; and also before the pigeons dispatched from the scene were able to settle down in a homeward direction. The instruments used were Morse sounders. The short description of the race which was finally sent contained over 150 words. Another conspicuous feature of the contest was the fleet of electric launches, which was the largest ever seen on the Thames.

ENDLESS ROPE HAULAGE BY ELECTRICITY.—The Leavenworth Coal Co., at Leavenworth, Kansas, says the *Colliery Engineer*, is arranging to drive the endless rope haulage machinery at the foot of the shaft by electric motors. There are two separate lines of rope, one on each side of the shaft, and the length of each is about 3500 feet. Each line will be operated by a 40-horse power Sperry electric motor. The power is at present applied to the work by a transmission rope from the surface. As the shaft is 710 feet deep and very wet, and the ropes are exposed to the influence of frost in the winter, their average life is only about eight months, while in the mine where the ropes are dry, the haulage ropes last from 3 to 4 years. By the use of the electric motors, the heavy expense of frequent renewals of the transmission ropes is overcome.

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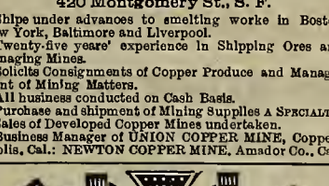
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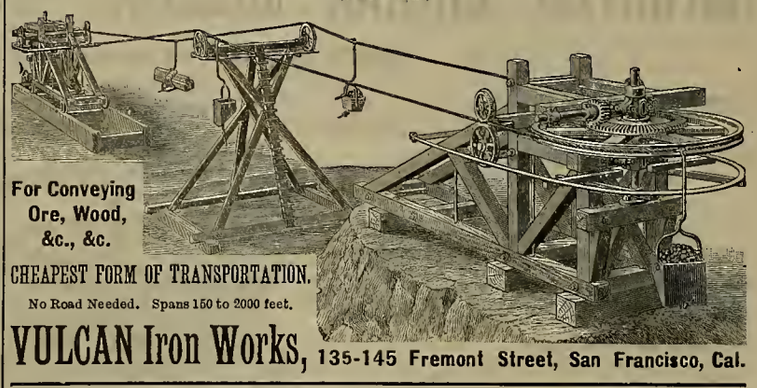
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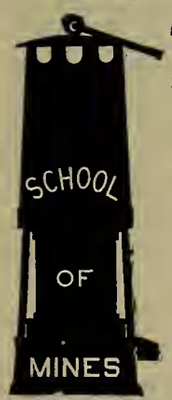

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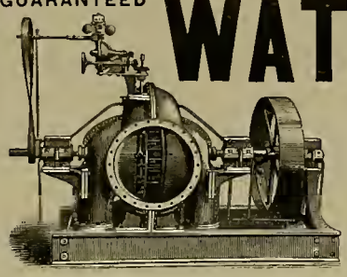
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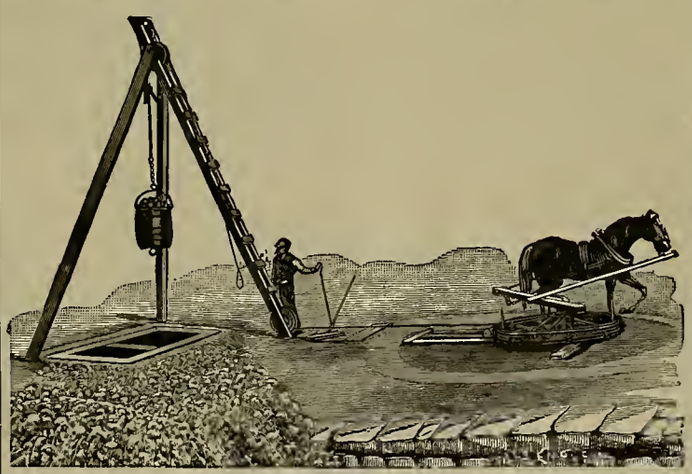

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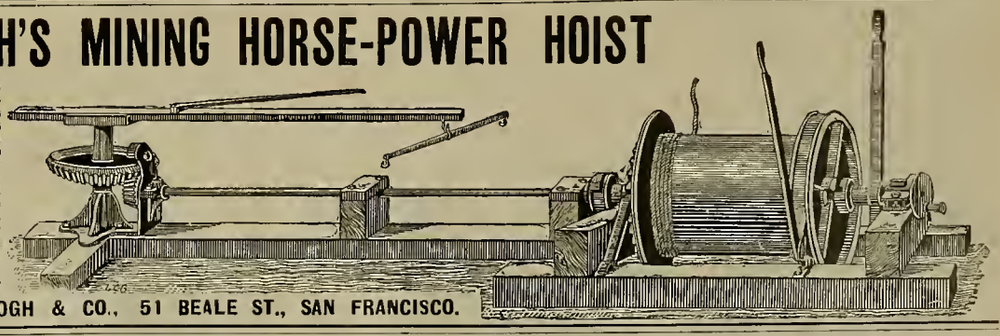
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JUNE 21, 1892.

477,197.—HEAD REST—J. A. Barker, Pasadena, Cal.

477,491.—FEED WATER HEATER—Jos. Bell, Trontdale, Or.

477,495.—WINDOW SHADE FIXTURE—Geo. Biehn, Tacoma, Wash.

477,361.—CONCRETE MIXER—G. F. & H. N. Gray, S. F.

477,362.—MACHINE FOR WRAPPING BLOCK MATCHES—Grisel & Severio, S. F.

477,537.—SASH FASTENER—D. Gutermute, Petaluma, Cal.

477,547.—REIN HOLDER—C. A. Hughes, Spokane, Wash.

477,371.—SAFETY ATTACHMENT FOR ELEVATORS—L. M. Kellogg, S. F.

477,274.—TABLE—A. F. Kinzler, S. F.

477,428.—FEED ROLL—G. H. Marsh, S. F.

477,217.—POCKET PERFUME CASE—John McCoy, Pasadena, Cal.

477,308.—FAUCET—J. M. McFarland, Virginia, Nev.

477,439.—CLOTHES DRIER—J. McKinnan, Colfax, Wash.

477,331.—BAG LOCK—H. McKinnon, Eureka, Cal.

477,573.—FURNITURE CASTER—R. R. Parrish, Portland, Or.

477,387.—SAWDUST BURNER—Scott & Sheafor, Mott, Cal.

477,469.—TRANSMITTING POWER—Tarpenning & Sherwood, Turlock, Cal.

477,474.—SIGN STENCILING MACHINE—G. H. Tietjen, S. F.

477,584.—CAN-HEADING MACHINE—M. A. Wheaton, S. F.

21,645.—DESIGN FOR PIN—J. A. Bidwell, Ivanpah, Cal.

The following brief list by telegraph, for June 29, will appear more complete on receipt of mail advices:

California—James W, Atkinson, Milpitas, spring gun; August G. Dahmer, Alameda, Door hanger; Thos. J Hubbell, San Bernardino, tree prop; Andrew W. Livingston and S. E. Sterrett, San Francisco, gun; George L. Moore and C Mary, assignors to W. T. Harris, Stockton, grape picker; August Pirch, Los Angeles, reversible plow; E win H. Rose, Colton, sewer, water and drain pipe laying device; Madison J. Russell, Los Angeles, bicycle stand; Charles P. Standford, elevator latch; William P. Walling, Santa Monica, elevated track or tramway Oregon—Henry Y. Clarke, assignor to the Portland Iron Works, Portland, adjustable cut-off valve gear; Horatio F. Hicks, Ashland, ore concentrator; John H. Peterson; Portland, lath holter. Washington—John Blair, Spokane, making white pigments; Arthur J. Shaw, Spokane, means for locking and unlocking mail pouches.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SAWDUST-BURNING AND AIR-BLAST APPARATUS.—Thos. T. Scott and J. J. Sheafor, Mott, Siskiyou Co. No. 477,387. Dated June 21, 1892. The invention relates to an apparatus for feeding sawdust, shavings and other refuse of woodworking machinery to furnaces where it can be disposed of, and a means for supplying an air-blast to said furnace; means for regulating the blast and distributing it, and also for supplying it to steam boilers, reduction, smelting and other furnaces.

MACHINE FOR WRAPPING BLOCK MATCHES.—George Grisel and Frank Severio, assignors of one-third to J. D. Case, S. F. No. 477,362. Dated June 21, 1892. This is an improvement on a former patent granted to George Grisel, the particular object of which machine is to wrap the paper around the composition ends of block matches. These are ordinary sulphur matches made in splints formed by splitting or cutting blocks of wood down to a certain distance, so that the splints all hold together by a web helow. It is usual to wrap with paper the upper or composition ends of the blocks to protect them. By this invention the wrapping of the blocks is all done by machinery.

SAFETY ATTACHMENT FOR ELEVATORS.—L. M. Kellogg, S. F. No. 477,371. Dated June 21, 1892. The invention consists essentially of a short air cylinder with an air-tight piston, connected with the hoisting mechanism of an elevator, and of valves by which the flow of air from the cylinder is regulated or arrested, so as to check or stop the downward movement of the cage in case of accident. The object is to provide a series of checks by which the downward movement of an elevator cage may be retarded or altogether arrested, either automatically or at will, these checks being operated independently of each other.

Eastern Metal Markets.

NEW YORK, June 30.—The followlng are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	40⅞	88¾	11 70	4 05	21 40
Friday	40 1-16	87⅞	11 70	4 05	21 40
Saturday	40⅛	87⅝	11 70	4 05	21 40
Monday	40¼	88	11 70	4 05	21 25
Tuesday	40 5-16	88	11 70	4 15	21 20
Wednesday	40 1-16	87¼	11 70	4 15	21 20

Pig tin is unsettled. Copper is steady but dull. Lead is firmer. Quicksilver is steady. Pig iron continues irregular.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, June 30, 1892.

General trade the past week, while only moderately fair, was fully up to the trade in the closing week in June in former years. There is no denying but that a feverish uncertainty of trade is giving place to that of buoyancy, and as each week passes, this feeling appears to gain in strength. This growing in confidence is largely promoted by several important trade factors, not the least of which are the following: A closer scrutiny of accounts has forced many weak merchants to the wall and others to limit their purchasing account and make collections so as to either cancel their indebtedness or place it in such position, when, by carrying the account, the wholesale merchant is comparatively safe. Large farms and tracts of waste lands are being cut up and marketed in small farms, and the last purchasers buying for homes, bring to their aid in the cultivation of the farms, all the modern improvements (scientific and otherwise) in the method of farming. No idle men, unless by choice, are to be found, while farmhands are receiving better pay than ever before. Railroad construction, both in the extension of main lines and the building of feeders, is being vigorously pushed. Railroad building invariably brings in its wake many improvements; small towns are being built up and farming land better cultivated. All these naturally create more business to manufacturers, and with all else being equal, our iron workers should, and probably do get the bulk of orders in their line. The high cost of raw material on this coast (about everything used has to pay duty or else high freight while at the East manufacturers have home supplies and low freights) is a serious drawback, yet it is, to a great extent, successfully combatted by superior work and a better knowledge of this coast's requirements.

The local money market continues easy. The semiannual settlements and the drawing in of considerable outlying funds have not had any visible effect on the market. The heavy disbursement which is to be made in next month (July) will soon find its way back into the general financial reservoir, when more funds will be added to the already oversupply. It is claimed that unless grain makes a sharp advance in price, large sums of money will be required by farmers, for they will prefer storing rather than to sell at around present market prices.

New York mail advices are still confirmatory of a sluggish oversupplied money market, but the consensus of opinion of the better informed financiers and also writers on financial topics, is that everything is pointing in the direction of a general revival in speculative and other securities. This position appears to be grounded on the following well substantiated facts and statistics.

From 1885 to 1888-89 there was a steady and constantly increasing expansion of credits, overbuilding of railroads and other constructions—in short a general exploiting of capital in every enterprise and in every country; more particularly in this country and in the South American States. In 1889 the unsound speculations and unwarranted enterprises began to collapse, and, though the Argentine-Baring panic did not come until the last half of 1890, there were premonitory symptoms of some impending crisis as early as the end of 1889, when the prices of iron began to decline, owing to the cessation of the demand. During nearly the whole of 1890 Europe was a heavy seller of American securities, because European finances were demoralized by the Argentine collapse, the Baring suspension, the embarassment of Portuguese and Spanish finances, the collapse of the Panama Canal project and other similar events. Europe wanted money, and sold American securities because they were almost the only thing that were salable. But for the last six months Europe has been full of idle money accumulated by these sales, and has only continued to sell Americans because speculative capital there was waiting for American capital to take the initiative in the recovery and speculative "boom" which was expected as the natural reaction from the long depression. With the prospect of fair crops this year, the contrast with 1888, when everything was ripe for the collapse of speculation, is very great. Instead of the market being gorged with new railroad bonds, as it was in 1888-9, there are now comparatively few new issues in the market. Railroad capitalization increases every year with the growth of the country, but instead of being increased $700,000,000, as it was in 1888, a moderate estimate for 1892 would be between $300,000,000 and $350,000,000. While there is this diminished output of securities, there has been an immense accumulation of wealth which will seek investment in interest-paying securities. As instances of this in this country, the deposits in the savings banks of the United States in June, 1891, were $1,623,029,749, against $1,364,196,550 in 1888, an increase of $258,833,199, and at the present date this increase has probably reached near $350,000,000. The deposits in the national banks of the United States in March, 1892, were $1,702,365,953, as compared with $1,409,000,000 in October, 1888, an increase of nearly $300,000,000. Since 1888 also, there has been an increase of over $200,000,000 of currency in circulation in the United States. All these are conditions which inoicate increasing wealth and warrant the expectation of higher prices for all sorts of interest and dividend paying investments.

SILVER—The market during the month of June fluctuated at strong prices. On the first day of the month the London market was quoted at 40⅝d per ounce, standard; by the seventh it had advanced, under buying for India, to 41⅛d, then, with a falling off in the demand from that source, the market shaded off, but, with increased Indian buying, the price on the 15th was 41d. After this date there was a steady decline up to the 24th, on which date the price was 40 1-16d. On the 25th it began to strengthen again. The market in this country and also the foreign markets are very sensitive and quickly response to any demand. It is claimed that on to-morrow a vote will be taken in the Senate on Stewart's silver bill, which, it is thought, will be favorable. The bill will go to the House for immediate action. If this should prove to be the case, then there is no doubt but the bill will be passed, for a Democratic House would hardly dare defeat more favorable legislation on silver. The coming international bimetallic convention is receiving an unusual degree of attention by financial and commercial journals abroad. The large majority appear favorable to the object sought. There was shipped the past week from this port to Japan $45,200 in silver bars.

MEXICAN DOLLARS—Exports the past week aggregate as follows: To Hong Kong $142,477, to Japan, $201,000. Total, $343,477. The market is fairly steady at 70½@71 cts.

QUICKSILVER—Receipts the past week aggregate 191 flasks. The market is steady at $44 per flask in lots less than 50 flasks and $43 50 in lots for 50 flasks and upward. The usual concessions are allowed on export lots.

BORAX—Recelpts aggregate 230 ctls. The market is fairly firm, but quiet.

LIME—Receipts aggregate 3,486 bbls. The market continues weak with a good demand ruling. Six thousand sacks of lime were sold the past week for Hawaiian Islands; tho shipment to be made from the source of supply.

PIG LEAD—Our market is essy at quotations. The East reports more offering which caused lower prices, but at the close the tone is stronger with fewer sellers in the market.

TIN—Pig is fairly steady at quotations. The demand is slow. More plate is being used than has been, which causes a steadier tone English cables report more business in plate for American account. New York mail advices report that market at a standstill for pig, pending liquidation between New York and London. It looks as if this is only temporary.

PIG IRON—The market is steady with a free consumption reported. There are few supplies on the way while low prices for American are against holders. It looks as if the latter will, to a considerable extent, supplant foreign. *Iron Age*, June 23, reports the New York market as follows: "The Southern furnaces have succeeded in placing a good deal of tonnage, by lowering prices to the lowest notch yet reached. Heavy sales are reported from Chicago, Cincinnati and Louisville. Gray Forge having been sold down to $8 50, Birmingham. Large sales are reported in Pittsburg of Bessemer Pig for forward delivery at practically the lowest prices reached. It is reported that the last decline is due to lower sales of ore at Cleveland, thus reducing the cost of production of the pig iron. This is confirmed to some extent by the fact that steel billets are being offered for August and forward delivery at prices as low as any made in the past.

COPPER—The market has retained a steady tone. It looks as if the international agreement was in part to keep the market from fluctuating to too low figures so as to net a loss, or of going too high so as to restrict consumption.

COAL—Imports the past week aggregate as follows: Newcastle, N. S. W., 5276; Seattle, 729; Nanaimo, 2800; Tacoma, 4000; total 12,805 tons. The consumption of steam is steadily enlarging and as there is no great increase in coal tonnage on the way, many dealers look for better prices this fall.

Mining Share Market.

SAN FRANCISCO, June 30, 1892.

The market was dull and heavy, with slightly lower quotations, up to Tuesday, when a steadier tone set in, which was followed on yesterday by slightly higher prices. The action of the market looks very much as if the mill rings and stock pools have come to the conclusion that any further depression might cause them to lose more shares than they could oy any possibility secure. There are quite a number of old-time miners and their friends who feel confident that in several of the mines on the Comstock there is more rich ore than the inside wish the public to believe. In acting on this conviction they have been and are still holders of shares in these mines, on which they pay regular assessments, with a heroism deserving of a better cause than to aid the rings to loot the mines. Miners now working in the Comstock mines unhesitatingly affirm that the lode is rathholed from one end to the other by drifts, crossdrifts, crosscuts, winzes and shafts, which make it possible to take ore from one mine and credit it to another It is this knowledge which makes them chary in operating on the bull side of the share market on reports of ore in any particular mine, for they firmly believe that it will not do outsiders any good, as it will be taken out, milled and the bullion credited to other mines, the shares of which and the method of mining and milling of ore are not so closely watched. They think that in this way much of the ore has disappeared. Even admitting this to be correct, yet we unhesitatingly affirm that in two or more mines there are important bodies of ore which should be shown up and dividends be paid. Why is it not done? This rooting around the grass roots or working on extreme upper levels will not do, although it is calculated to throw outside shareholders off the track. It seems to be about time to make a more pronounced move looking to the extraction of the ore and giving credit to the mine or mines to which it rightly belongs.

The history of the Comstock lode is prolific with secrets, which when brought to light will cause more surprise to the street than did any revelation in the suit against the Nevada Bank directors. It will tend to prove that the old saying that dead men cannot tell tales does not hold good so far as Comstock mining is concerned.

Immediately following Judge Hebbard's decision in the Hale & Norcross suit, a reported friend of H. M. Levy, told the writer in the presence of two persons, that the decision would amount to nothing as it would be appealed and on such weak points that the Supreme Court of this State would reverse the decision and send the case back for retrial. It was said that everything would "go by the board" or else only a very small judgment be secured. The person even affirmed that a majority of the judges of the Supreme Court might, if such a thing were possible, be influenced in defendant's favor. It is to be honed that the speaker was in error, yet who can tell?

From information at hand it looks as if in 1893 a new era will set in on the Comstock lode, but whether it will be for mine-looting or honest management by which shareholders will be benefited, is, as yet, an open question. The long contention about the Sutro tunnel appears to have been settled at last; experiments have been made with Comstock ore, which show that the most refractory and also the low grade can be mined and milled at a profit; electricity as a motor power will be used at the mouth of the Comstock (formerly called Sutro) tunnel and the ore brought from the mines through the tunnel to mills which are to be built at or near the mouth of the tunnel. By sending the ore through the tunnel, a large saving will be made in extracting ore, less he paid for transportation and less paid for milling, particularly with electricity used for motor power.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED, DELINQ'T AND SALE.	SECRETARY.
Alta S M Co, Nevada	42	15c.	June 18, July 26, Aug 16	L Osborn, 309 Montgomery
Belcher S M Co, Nevada	44	25c.	May 17, June 21, July 12	O L Perkins, 331 Pine
Bodie Cons M Co, California	14	25...	June 20, July 22, Aug 22	H D Walker, 309 Montgomery
Bullion M Co, Nevada	38	25c.	May 24, June 28, July 19	R. R. Grayson, 331 Pine
Butte King M Co, Nevada	8	5c.	June 4, July 11, Aug 2	W C Lewis, 723 Market
Challenge Con M Co, Nevada	11	25c.	May 16, June 20, July 12	C L McCoy, 331 Pine
Chollar M Co, Nevada	33	50c.	May 28, June 7, July 27	C E Elliott, 309 Montgomery
Commonwealth Cons M Co, Nevada	3	10c.	June 15, July 21, Aug 18	R R Grayson, 331 Pine
Con St. Gothard M Co, California	5	5c.	June 9, July 14, Aug 4	T Wetzel, 320 Sansome
Cons New York M Co, Nevada	8	10c.	June 28, Aug 2, Aug 23	C E Elliott, 309 Montgomery
Evening Star M Co, California	4	2½c.	June 7, July 12, July 29	J J Scoville, 320 Sansome
Fall River Con M Co, California	8	3c.	May 27, July 2, July 27	A Lorsbach, 409 Clay
Golden Prize Con M Co, Nevada	5	25c.	Feb 29, June 22, July 13	C D Bennett, 327 Market
Gould & Curry M Co, Nevada	69	25c.	June 7, July 12, Aug 4	A K Durbrow, 309 Montgomery
Mexican G & S M Co, Nevada	35	25c.	May 16, June 21, July 12	O E Elliott, 309 Montgomery
Mexican Phosphate and Sulphur Co	1	10c.	June 8, July 18, Aug 8	A Halsey, 328 Montgomery
Ophir M Co, Nevada	8	50c.	June 3, July 7, July 27	E B Holmes, 309 Montgomery
Overman M Co, Nevada	—	30c.	May 19, June 22, July 11	G D Edwards, 414 California
Sierra Nevada M Co, Nevada	10	25c.	June 10, July 13, Aug 2	E L Parker, 309 Montgomery
Siskiyou Cons Quicksilver Co, California	4	1c.	May 14, June 17, July 8	E. E. Slope, 306 Pine
Summit M Co, California	12	5c.	June 27, July 19	M E Welles, 309 Montgomery
Terkoff G M & M Co, California	8	1c.	May 31, July 6, July 29	W J Gur ett, 308 Pine
Utah Con M Co, Nevada	15	25c.	June 7, July 11, July 29	A H Fish, 309 Montgomery
Yellow Jacket M Co, Nevada	51	25c.	May 9, June 14, July 18	W H Blanvelt, Gold Hill

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Best & Belcher M Co, Nevada	Annual	L Osborn, 309 Montgomery	July 11
Union Cons M Co	Annual	A W Barrows, 303 California	July 18

LATEST DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	10	T Wetzel, 320 Pine	Jan 9 10
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	July 11
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 15	English, lb	— @ 18
BORAX.		Cast	— @ 8½
Refined, in car lots	— @ 7½	Bl'k Diam'd tool	— @ 8½
Powdered, do	— @ 7½	Pick & Hammer	— @ 9
Concentrat'd, do	— @ 6½	Machinery	— @ 4½
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE.**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 00
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 6 00
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 6 00
Fire Box Sheete	22 @ 24	Do, do, 20x28	— @12 00
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot	—@ 24
Norway, base	— @ 4½	**COAL.**	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton, ton	22 00@— —	Wellington	$8 00
Glengarnock	23 00@— —	Gretta	6 76
Am. Soft, No. 1	24 00@— —	Nanaimo	7 00
Oregon Pig	— —@— —	Gilman	6 00
Puget Sound	— —@— —	Seattle	6 60
Clay Lane White	24 00@— —	Coos Bay	5 50
Langloan	22 00@— —	Cannel	8 50
Thorncliffe	23 00@— —	Egg bard	11 50
Gartsherrie	22 00@— —	Cumberland, in sacks	14 00
Barrow	22 00@— —	Wallsend	7 00
Carnoffeet	22 00@— —	Scotch Splint	7 00
CHROME IRON ORE.		Brymbo	6 75
Per ton	10 00 @— —	West Hartley	7 50
LEAD.		TO LOAD—PER TON.	
Pig	— @ 4½	Australian	5 75@— —
Bar	— @ 6½	Liverpool Steam	6 00@— —
Sheet	— @ 7	Scotch Splint	6 00@— —
Pipe	— @ 6½	Cardiff	6 25@— —
SHOT.		Lehigh Lump	12 00@— —
(Discount 10% on 500 bags.)		Cumberland	9 00@— —
Drop, in bag	1 80 @ —	Egg bard	10 00@— —
Buck, in bag	2 00 @ —	West Hartley	6 50@— —
Chilled, do	2 20 @ —	**COKE.**	
QUICKSILVER.		English, to load	$8 00@ 9 00
Home trade, pr. flask	43 60 @44 00	Do, spot, in bulk	10 00@— —
For export	38 @	Do, in sacks	12 00@— —
		Cumberland	9 00@— —

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 8.		WEEK ENDING June 15.		WEEK ENDING June 22.		WEEK ENDING June 29.	
Alpha	.20	.25	.15	.25	.20	....	.15	.20
Alta	.25	.40	.30	.40	.15	.30	.15	.20
Andes	.45	.50	.40	.45	.35	.40	.30	.35
Belcher	.75	.90	.60	.90	.60	*1.20	1 05	1.20
Belle Isle	.10	....	....	....	....	....	.05	....
Best & Belcher	1.90	2.10	1.80	2.15	1.75	1.95	1.65	1.65
Bullion	.50	.60	.40	.50	.33	.40	.30	*.55
Bodie Con	.30	....	.15	.25	.15	.20	.10	.16
Bulwer	....	....	.50	....	.40	.45	....	....
Commonwealth	....	....	....	.25	....	....	.15	....
Con. Va. & Cal	3.75	4.05	3.60	4.05	3.60	3.85	3.20	3.55
Challenge	.25	.30	.15	.30	.25	.40	.15	.20
Obollar	.40	.55	.35	.45	.25	.35	.20	*.70
Confidence	1.50	1.60	1.25	....	....	....	1.25	....
Con. Imperial	5.10	....	.15	....	....	....	.05	....
Caledonia	.20	.25	.20	.25	.20	....	.15	.25
Crown Point	.80	.95	.75	1.00	.75	.99	.70	.85
Crocker	....	....	....	....	....	....	....	....
Del Monte	....	....	.10	.15	....	....	....	....
Eureka Con	2.00	....	....	....	....	....	....	....
Exchequer	.15	.20	.15	....	.10	.15	.10	....
Grand Prize	....	....	.10	....	.10	....	....	....
Gould & Curry	.90	1.15	.90	1.10	.75	.85	.55	.70
Hale & Norcross	1.25	1.55	1.25	1.45	1.10	1.40	1.25	1.40
Julia	....	....	.15	....	....	....	....	....
Justice	.15	.20	....	....	.15	....	....	....
Kentuck	.10	....	.05	.10	.10	....	.10	....
Lady Wash	.10	....	....	....	....	....	....	....
Mono	.40	.45	.40	.45	.30	.35	....	....
Mexican	1.40	1.75	1.35	1.45	1.30	1.55	1.25	1.40
Navajo	....	....	....	....	.05	....	.3	....
North Belle Isle	.15	....	.15	....	....	....	.10	.15
Nev. Queen	.90	1.05	.45	.90	.45	.50	.45	.50
Occidental	.30	.40	.40	.45	.35	....	.30	.35
Ophir	2.35	2 95	2.15	2.45	1.80	2.25	1.35	1.80
Overman	.35	.45	.40	.60	.30	*.60	.50	.60
Potosi	.65	.85	.50	.65	.40	.50	.60	.55
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	.05	....	.10	....	....
Savage	1.30	2.30	1.85	2.10	1.40	1.65	1.35	1.45
S. B. & M	.20	.25	.20	.35	.20	.30	.25	....
Sierra Nevada	1.05	1.15	.80	1.15	.80	.85	.60	.80
Silver Hill	.10	....	.05	....	.05	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.00	1.16	.85	1.10	.80	1.00	.70	.90
Utah	.16	.25	.10	.15	.10	....	.05	....
Yellow Jacket	.45	.60	*.76	.90	.75	.90	.75	.85

*Assessment added.

DIVIDEND NOTICE.

The German Savings and Loan Society,

526 California Street.

FOR THE HALF YEAR ENDING JUNE 30, 1892, A dividend has been declared at the rate of five and one-tenth (5 1-10) per cent. per annum on Term Deposits, and four and one-quarter (4¼) per cent. per annum on Ordinary Deposits, payable on and after FRIDAY, July 1, 1892. GEO. TOURNY, Secretary.

DIVIDEND NOTICE.

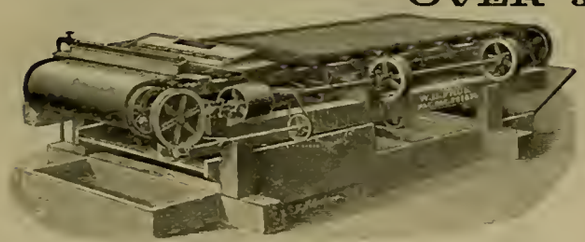
OFFICE OF THE PACIFIC COAST BORAX COMpany. San Francisco, June 30, 1892. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 19) of One Dollar ($1.00) per share was declared, payable MONDAY, July 11, 1892, at the office of the company, No. 101 Sansome Street, Room 26. Transfer books will close July 5, 1892, at 3 o'clock, P. M.

ALTON H. CLOUGH, Secretary.

FRUE ORE CONCENTRATOR

OVER 3200 IN ACTUAL USE.

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; and March 31, 1891.



GLADSTONE MINING COMPANY, C. J. Clark, M. E. Gen'l. Supt. FRENCH GULCH, Calaveras Co., Cal., Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to mention. In order to give an idea of the work they are doing here I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
" " " Improved Belt Frue Vanner ..... 800, f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 800, f. o. b.

For any information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO.,

No. 132 Market Street, - - - San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

(PATENTED.)

The competitive trials which have been held between the "Trimph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

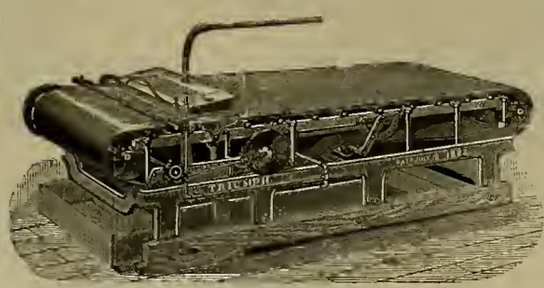
—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if used here.

Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,

39 to 51 Fremont Street, San Francisco, Cal.

Both the "Trimph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., NOV. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID MCKAY, JR.,

Signed] Sup't North Star and Original Empire Mining Co.

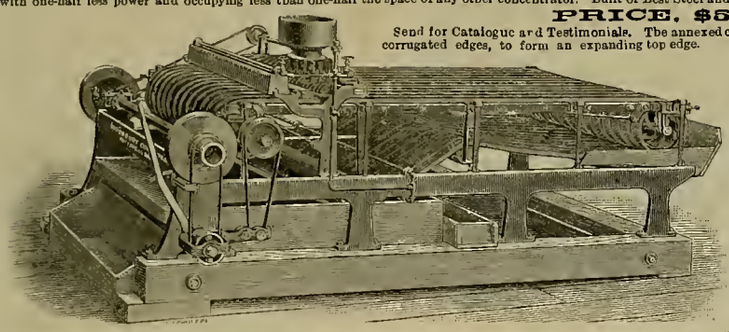
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS

Was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891. MORE THAN DOUBLE THE CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of Best Steel and Wrought Iron. Strong and Durable.

PRICE, $575, f. o. b.

Send for Catalogue and Testimonials. The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge.



THE SAN JACINTO ESTATE—Office of the General Manager. OJALCO, Oct. 30 1891.

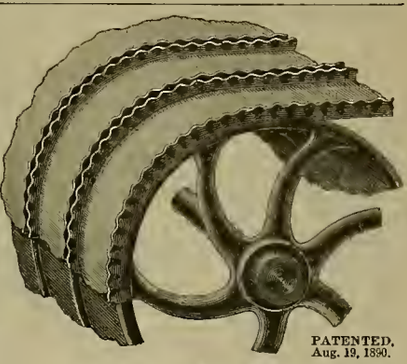
GEO. E. WOODBURY, ESQ.—Dear Sir: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" Concentrator placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the concentrates equally clean, as from either of the machines at work here

[Copy] Yours faithfully, S. HARRIS, Manager.

THE SAN JACINTO ESTATE, LIMITED—Office of General Representative, P. O. address, South Riverside, San Bernardino County.

OJALCO, February 17th, 1892.

GEO. E. WOODBURY:—Your letter of inquiry about your concentrator came to hand in due course. Your machine is doing well, the motion is all right, and the machine is giving entire satisfaction. Yours faithfully, S. HARRIS.



PATENTED, Aug. 19, 1890.

GEO. E. WOODBURY, Man'f'r, 213 to 219 First St., San Francisco.

PLACER AMALGAMATORS

Combined with Steam Shovel or Dredge.

BUCYRUS SYSTEM.

NEW METHOD OF PLACER MINING.

Saves all the Gold. Uses very little Water. Treats large quantities at Low Cost.

—BUILT SOLELY BY THE—

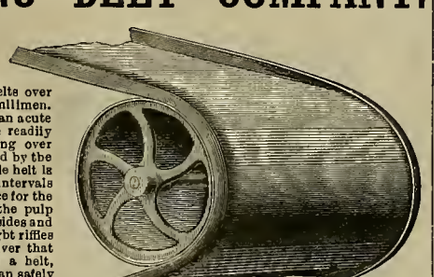
BUCYRUS STEAM SHOVEL AND DREDGE COMPANY,

BUCYRUS, OHIO, U. S. A.

THE BLASDEL CONCENTRATING BELT COMPANY.

We have now made arrangements to have our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over *any others* will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that could otherwise escape with the tailings from a belt, the surface of which is entirely smooth. We can safely say that it is a better belt than has ever been manufactured for use on this coast. It will last much longer and will handle fully one-third more pulp than any smooth belt, and will save a higher percentage of sulphurets



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco

FRISBEE-LUCOP MILL CO.,

—MANUFACTURERS OF—

Centrifugal Roller Steel Mills,

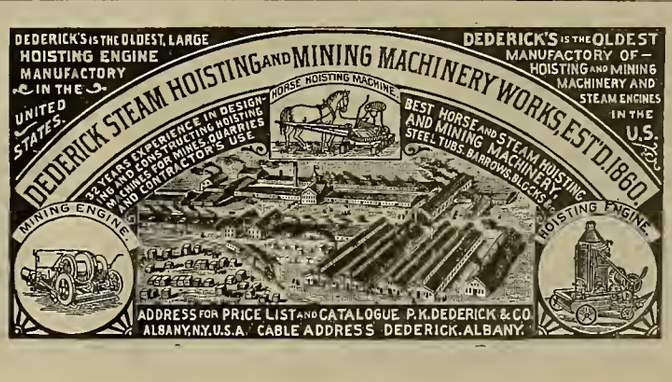
FOR PULVERIZING ORES, WET OR DRY,

For Amalgamation or Concentration, and for Manufacture of Cement, Fertilizers, Paint and all other purposes for which grinding or pulverizing is required.

Send for Catalogue and Price List to

FRISBEE-LUCOP MILL CO.,

145 BROADWAY, NEW YORK.


DEDERICK'S IS THE OLDEST, LARGE HOISTING ENGINE MANUFACTORY IN THE UNITED STATES.
DEDERICK'S IS THE OLDEST MANUFACTORY OF—HOISTING AND MINING MACHINERY AND STEAM ENGINES IN THE U.S.
DEDERICK STEAM HOISTING AND MINING MACHINERY WORKS, ESTD. 1860.
32 YEARS EXPERIENCE IN DESIGNING AND CONSTRUCTING HOISTING ENGINES FOR MINES, QUARRIES AND CONTRACTOR'S USE.
HORSE HOISTING MACHINE.
BEST HORSE AND STEAM HOISTING AND MINING MACHINERY. STEEL TUBS, BARROWS, BUCKETS.
MINING ENGINE.
HOISTING ENGINE.
ADDRESS FOR PRICE LIST AND CATALOGUE P.K. DEDERICK & CO. ALBANY, N.Y. U.S.A. CABLE ADDRESS DEDERICK, ALBANY.

PACIFIC GAS OR GASOLINE ENGINES.

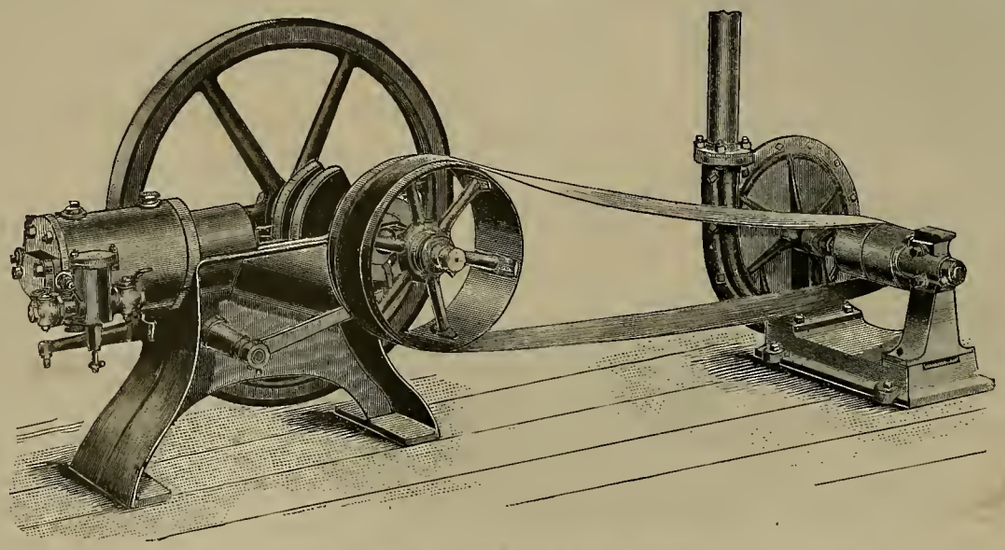
REGAN VAPOR ENGINES.

No Fire!

No Ashes!

No Boiler!

No Smoke!



No Engineer!

No Danger!

LAUNCHES! ENGINES FOR ALL KINDS OF WORK!

Over 800 in Actual Use on this Coast, Running Pumps, Hoisting Works, Machinery of all kinds, and Boats.

UNION GAS ENGINE CO.

SEND FOR CATALOGUE. 221-223 FIRST STREET, SAN FRANCISCO, CAL.

MANUFACTURERS FOR THIRTY-THREE YEARS.

CALIFORNIA WIRE WORKS

OFFICE, 9 FREMONT ST., SAN FRANCISCO, CAL.

LOS ANGELES AGENCY, LOS ANGELES, CAL. PORTLAND AGENCY, PORTLAND, OREGON.

WIRE ROPES
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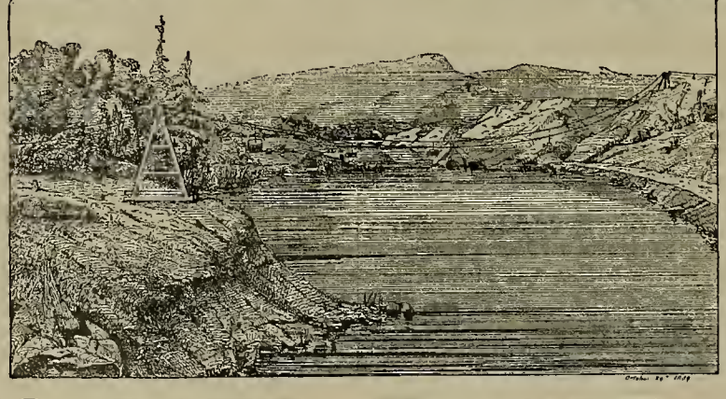

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SAN FRANCISCO, SATURDAY, JULY 9, 1892.

Three Dollars per Annum
Single Copies, 10 Cents.

A New Method of Placer Mining — The "Bucyrus" Amalgamator.

The new method of placer mining, using the Bucyrus patent amalgamator, is the result of much practical study and experiment. It claims to include all the best features of value found in any system of amalgamation. For a long time the Bucyrus Steam Shovel and Dredge Company, Bucyrus, Ohio, sole manufacturers, have been maturing the system and perfecting the plant in actual operation, and believe they have now established its success beyond question, and are willing to guarantee that it will save even to the finest particle of gold.

The "Bucyrus" patent amalgamator consists of a strong wrought iron tank, lined with amalgam plates. In one end of the tank is mounted a revolving cylinder 78 inches in diameter, having openings in each end through which material is received and discharged. This cylinder is formed by a double screen, with an annular space between them, the inner screen being of a heavy steel plate with coarse holes punched in it, and the outer screen being of fine wire cloth. Of the material dumped into the cylinder, the stones and coarse gravel are retained by the inner screen and ejected by the revolving bucket in the discharge end of the cylinder. The finer gravel is retained by the second screen, after passing through the first, and also ejected, while the sand and gold particles sift through both screens into the tank. The arrangement of screen cylinders and internal helix for conveying the material is shown in Figs. 3 and 4. It will be seen that about one-third of the cylinder, being the part containing the material, is submerged in the tank, and that, therefore, the material is subjected to the most thorough washing and tumbling during its passage through the cylinder.

The length of the internal helix is 72 feet; each particle of gravel is tumbled over that length of coarse screen, during washing. Similarly, the finer material is tumbled over 120 feet of screen in the outer helix, thus securing more perfect washing and screening than could be accomplished in any other way in a similar space. The construction of the helix and ejecting buckets is the subject of special improvement, whereby great discharging capacity is secured, and also great strength to withstand the charging of large quantities of material. Amalgamators, as heretofore made, have only been adapted to receive such material as could be fed them by hand or wheelbarrow. The charge of one ton, twice a minute (this being the capacity of the steam shovel intended to be used with the "Bucyrus" amalgamator), is a very different thing and calls for different treatment, and a construction that is solid enough to withstand continuous service under such conditions.

The gold-bearing sand and gravel, after passing through the screens into the tanks, tends to settle to the bottom, under the cylinder. It is prevented from doing so by jets of water issuing from small inclined nozzles in the bottom of the tank, which maintain the sand and gold in suspension, and which are so directed as to cast it repeatedly over the amalgam plates, with which the tank is lined. Every particle is in this way brought a great number of times in direct contact with the plates, so that none of the gold has a chance to escape. The same jets are so directed as to have the effect of working the sand toward the rear end of the tank, from whence it escapes as tailings, through a suitable valve.

The pressure of water required for these jets is about 20 pounds per square inch, and the quantity about 600 gallons per minute. By suitable arrangement to drain off the tailings the same water can be used over and over again, only enough of a supply being necessary to make good the losses by seepage and evaporation. The pumps to furnish the pressure can be located at any convenient point.

The long experience of the Bucyrus Steam Shovel and Dredge Company, as designers and builders of dredging and excavating machinery enables them to produce an excavator or steam shovel that is specially adapted for use in connection with the amalgamator just described, and powerful enough to deal with large quantities of material and to withstand continuous rough and heavy service.

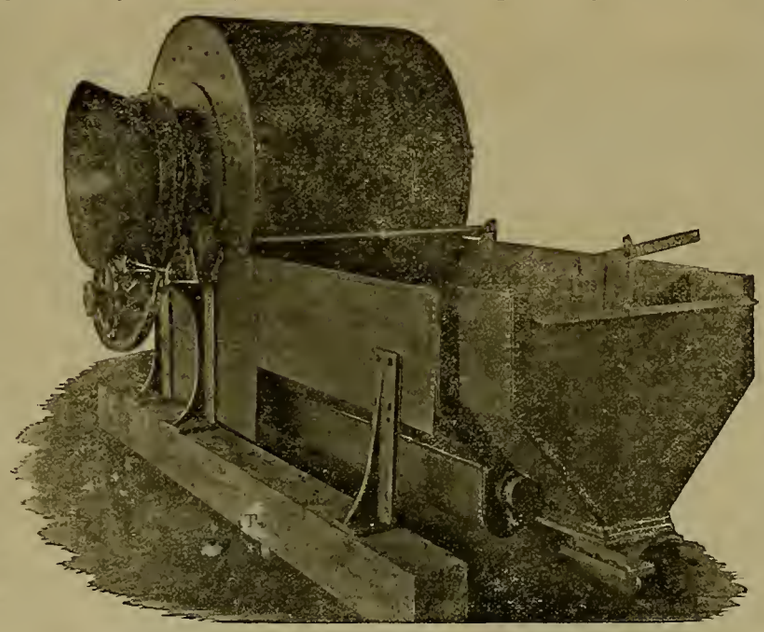

FIG. 1. — THE "BUCYRUS" AMALGAMATOR, WITHOUT ATTACHMENTS.

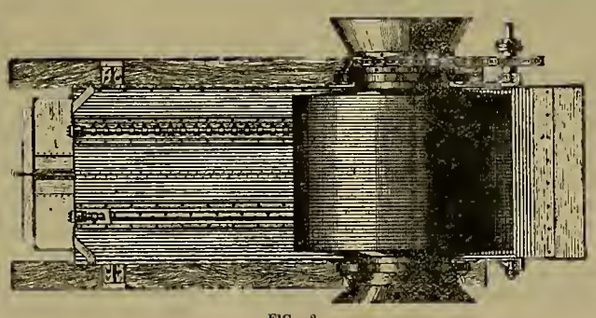

FIG. 2.

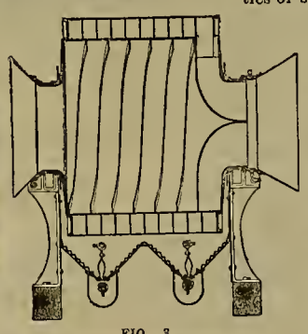

FIG. 3.

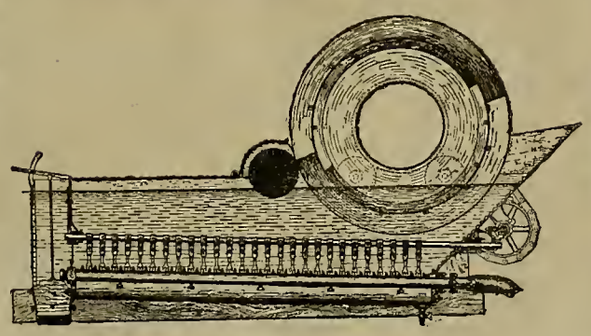

FIG. 4.

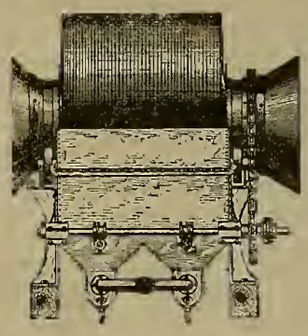

FIG. 5.

SECTIONAL VIEWS OF "BUCYRUS" AMALGAMATOR.

At Sutro.—Representatives of a New York electric company are at Sutro, looking over the ground and estimating the cost of constructing an electric plant on the Carson river and running the mill at Sutro on ore to be conveyed from the Comstock mines through the Sutro tunnel. While it has not been definitely settled to erect a mill at Sutro, the president of the tunnel company, Theodore Sutro, has been on the ground the past two weeks, making calculations and figuring on the possibilities of such an enterprise. It would mean the instillation of new life into the Comstock mines, the greater prosperity of the Sutro tunnel, and renewed activity at the little town of Sutro

---

John D. Sagemiller died in this city on Friday, June 24th. He arrived in this city from Seattle on June 8th, and was on his way to Carlsbad. A week ago he was taken ill, and the physician called to attend him said that it was impossible to save his life. Mr. Sagemiller had extensive and very valuable mining interests in Alaska, where for years during the summer months he made his home. In 1870 he was the first man to build a house in Juneau, where he made his headquarters and enjoyed the distinction of being one of the first of the white pioneers. He was also fortunate enough to buy considerable land in Seattle before the boom, and to realize big profits from his investments.

Guatemala Mines.—Private correspondence from Guatemala, under date of June 16, states that the Santiago mill is soon to be stopped pending the prosecution of explorations in the Rosario mine at Mataquescuintla, owned by Messrs. Cabarrus & Co. The Rosario is the only silver mine that has been worked to any great extent in Guatemala in recent years. For the past year the mill has been under the supervision of Mr. Julius Partz, formerly of Partzwick in Mono county.

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SAN FRANCISCO, SATURDAY, JULY 9, 1892.

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The Mexican Mining Law.

On page 29, under the heading of "New Tax on Mines," is given the provisions of the mining law now in force in Mexico. It is a radical change from previous conditions. A federal tax guaranteeing absolute ownership of mines is created. On each *pertenencia* (a square of 100 meters to the side described on a horizontal plane without reference to the inequalities of the ground), they charge a tax of $10 for the title deed. After the 1st of July, a tax of $10 per annum is to be paid on every *pertenencia* or fraction thereof of which a mining property consists. This annual tax is to be paid in advance in triennial installments. The tax is doubled should there be any misstatements or concealments as to the area of the mining property. Failure to pay the annual tax in the first month of the period specified is punished by a fine, and at the expiration of the third month the right to the mine lapses, and the property is forfeited.

There is something definite in this new law. A man pays so much for his title, getting it at once. To maintain the title he must make annual payment in installments. If he does not pay he loses his mine. There is no keeping up the mining title by annual expenditure, such as we have, but the money is paid the Government. There is one thing certain about such a proposition. The mines will be kept actively at work. They cannot be left idle for years or relocated from year to year, as with us. A man who keeps an idle mine must pay for the privilege, and few people will care to do this. Our own system in this country is defective in many respects, and we are not as progressive in this direction as the Mexicans. Our code of mining laws was originally founded on theirs, and what we have called improvements on it are, to say the least, doubtful. Their aim appears to be to keep the mining properties active, and we have tried to do the same thing. This new system of Mexico will excel ours for this purpose, though the annual tax is paid to the Government with them instead of being spent on the mine, as with us.

Yuba County Quartz.

We met this week Mr. R. H. Daly, the architect of this city, who has recently returned from the old town of Timbuctoo, Yuba county where he has relocated under the name of the Boa, the old Bull Head quartz mine. Nothing has been done on the claim for 30 years, yet there are fine facilities for working the claim and the rock is rich. This ledge averages in size from three to six feet in width, and holds its own as far down as they have gone. A quartz mill of 20 stamps capacity is to be erected, and its motive power will be run by water pressure and a Pelton wheel.

James Galvin is the superintendent, and he has great faith in the mine; believes it will be very profitable and do much to bring out other undeveloped claims near Smartsville. Mr. Daly has shown us the certificates of assays made by Prof. Hanks, which show that the samples of rock submitted for test ran $72.34 in gold and $9 82 in silver, a total of $82.16 per ton. The rock carries four per cent sulphurets valued at $1485.78 per ton. This is pretty good rock to be lying out of doors with no one to take it up.

Mr. Daly was for many years connected with mining affairs. He was one of the original locators of what afterward became the Raymond & Ely Claim, and was also one of the first prospectors of the Boise basin, Idaho. He is pleased to find in a pleasant part of the state so fine a claim as the one relocated. With modern implements of mining and approved appliances the mine can pay now whereas it could not at the time it was orginally worked. He and Daniel Kennedy run the Boa Mine and are now at work developing it.

Hope for Silver.

The passage of the Silver bill by the Senate came in the nature of a surprise last week for although the silver men have been hard at work, they had almost given up hope of accomplishing anything this session. The bill must now go to the Coinage Committee of the House, of which seven members out of the twelve are said to be favorable. The Democratic House can hardly afford to refuse to pass the bill and the matter will then come to the President and rest in his hands. What he will do remains to be seen. He is not an advocate of free silver but doubtless he will argue if the representatives of the people have passed the bill it will be well for him to sign it. As a matter of political expediency he may feel compelled to do it.

It has been a matter of regret that the silver measure became a political issue; but as the matter stands now it seems fortunate after all. In trying to shift the responsibility from one party to the other both will have to pass the bill.

As far as the mining communities of this coast are concerned, the passage of a free coinage bill will make a wonderful difference. This State is not so directly interested since we only produce about a million dollars worth of silver a year. But Nevada and other States have felt the depreciation of the metal sorely, and their mining interests are languishing in consequence. With free silver, mines, mills and furnaces will start up in all directions, giving employment to thousands of men now idle. The miners are naturally most anxious for the measure to pass, and the attendant industries in the silver-producing States will at once experience a revival, which will make good times in all these communities.

Royalty Charges on Processes.

The company which owns the MacArthur-Forrest cyanide process in this country charges too much royalty for its use. If it is to be applied to low-grade ores there will be a decided limit to the number of mines of this class using it. The question of relative economy should be better considered. If people are working ore as many are, which only yields $3 or $4 a ton at a present cost for mining and milling of 50 cents to $1 per ton, they can not pay $1 per ton royalty to use this process and $1.50 per ton for cost of process. It is a low estimate of cost to put the expense of working the cyanide process at $1.50 per ton without the royalty; and where people have already methods as cheap as those in use in California, the low-grade quartz men will let the new system severely alone.

In fact it is the universal judgment which has been confirmed by experience, that the principle of royalty is a wrong one as applied to industrial processes. It has been tried in a thousand instances and failed, beginning with the Whitney cotton-gin process and traced through the history of inventions. Of course a fair living profit should be charged on the process and the others left to reap the reward. Counting up the number of tons worked and charging on each is wrong in principle. At any rate, if the charges are to be made in that way, there should be some discrimination in the matter of the value of the ore worked. Ore worth $100 a ton could easily pay the $1 per ton royalty while it would be prohibitory on $5 rock. It would be better to graduate the charges in some way so as to make it fairer than the present plan.

THE drawing of the cyanide process plant published in the PRESS of last week, sketched by Mr. Paul, was not intended to represent either of the mills under his charge in Shasta county, but was merely his suggestion for the arrangement of a small cyanide process plant.

The Labor Troubles in Pennsylvania.

The attention of the whole country has been attracted to the labor troubles at the Carnegie Works near Pittsburg by reason of the great interests involved and the bloodshed which has resulted. On Wednesday there was a conflict between the Pinkerton detective force and the men at the Homestead Works in which 21 men were killed and 50 wounded. Burning oil, dynamite, rifles and cannon were used in the effort to keep the Pinkerton men out of the works. Some 4000 employees resisted the advent of these men and it was during this resistance that the fatal fighting took place. The Pinkerton men finally surrendered and were badly maltreated by the mob when they came ashore from the barges which had brought them to the bank of the river near the works. Workmen from other mills came to the assistance of those at the Homestead plant and the men from the whole iron-working region thereabouts are intensely excited.

The trouble has been brewing for a month or so past. The Carnegie company submitted a scale which was to govern the workmen in the steel plants and announced that it was their ultimatum. The scale made sweeping reductions in the wages of skilled men, and it was officially announced that unless the terms were complied with before July 1st the places of the workmen would be filled by others.

This was followed by a peremptory refusal by the company to recognize the Amalgamated Association. The men announced their determination to resist any effort on the part of Carnegie to run the plant with nonunion men. Trouble was precipitated by the workmen at Homestead hanging H. C. Frick, President of the company in effigy, and in retaliation the company ordered an immediate shut down of the big works. The employees at once proceeded to orgauize for the defensive and the company erected a high board fence around the entire works, giving them the appearance of an immense stockade, the sides being pierced with port holes. Then when the Pinkerton men came to go inside the fence to protect the works the conflict began in which men were killed.

The occurrence was a most unfortunate one indeed. It may, however, be of benefit in the end in one direction and that the abolition of the band of hired mercenaries known as the Pinkerton men. When occasion arises to protect industrial works from the attacks of men, the police and sheriffs should be called upon; if they cannot suppress a mob, the militia or even regular troops would be available should circumstances demand it.

These men would not have fired on militia as they did on people hired for money to carry out the ideas of the owners, and peaceable possession of the works would have been obtained. But they were angered at the presence of these mercenaries, and in the end behaved outrageously to them upon surrender.

THE SAN FRANCISCO DELEGATES to the Mining Congress at Helena met in Nevada Block on Wednesday, present, Attorney-General Hart, Louis Janin, State Mineralogist Irelan, W. S. Keyes, Charles G. Yale (of the MINING AND SCIENTIFIC PRESS), W. S. Lyle and T. S. Church. It was decided to adopt the unit rule for the delegation and those unable to attend left their proxies with Mr. Hart. This city is entitled to 31 delegates. Judge Niles Sealres, of Nevada County, who was President at the last session of the congress, leaves for Helena Saturday with the San Francisco delegation.

THE beet sugar industry in this State is growing in importance. This year the three sugar factories, one each at Chino, San Bernardino county, Alvarado, Alameda county, and Watsonville, Santa Cruz county, will be run to their full limit of production. Over 450 men will be employed in and about them in making the sugar. Their combined capacity is about 318,000 pounds per day, and it is estimated that 37,000,000 pounds of sugar will be turned out during the three months they will be in operation before the beet crop is used up.

A PROMINENT Nevada silver man says: "We are all for silver in Nye and Lander. The mines are all closed down and we know what caused it. Party lines are wiped out, and we no longer know any party. We are ready to fall in line under the banner of silver. If the old parties do not give us what we want we will vote solidly for the third party that puts up a silver candidate. We may not elect our candidate, but we will show the Eastern politicians that our talk is not idle talk, and that we mean to keep this fight up until recognized."

DOWN in Los Angeles county they are studying up the matter of utilizing the water of the San Gabriel river for mechanical purposes. Surveys for the location of the dynamos at the mouth of the canyon have been made, and negotiations for the right of way over land up the canyon carried on. It looks now as if this matter is assuming a practical shape.

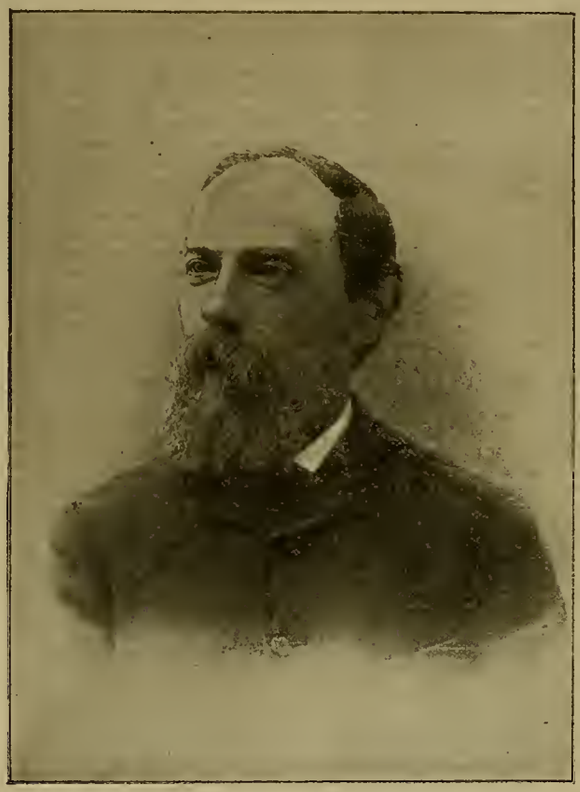
The Professor of Agriculture at the State University.

After nearly 18 years of unremitting service, the Regents of the State University granted Professor Hilgard one year's leave of absence for rest and foreign travel, and last week he and his family took their departure. In his absence, we bring to the attention of our readers certain phases of his life and work, which are not perhaps widely known here, and which, in the progress of his active labors among us, it did not seem so fitting to recall. It is not our intention to allude at length to the facts best known to Californians; to his coming here at a time when the relations between the agriculturists and the university were somewhat strained, because, perhaps, of mutual misunderstandings, and of his signal success in winning for the university new interest and favor, by his personal acceptability, by his earnest and honest zeal in the agricultural interest, and by the exceptional originality and ability which characterized his work. Nor is it necessary to enlarge upon his success in building up the agricultural department of the State University, and in undertaking agricultural experiment station work so early that California can claim priority in efforts which are now progressing in all the States and Territories. These facts are known to most of our readers, as are also the extent and variety of his agricultural researches, which have furnished a basis for many industries and a motive force in others. It is rather the personal history of the man and the features of his work which have attracted widest attention abroad, as well as in California, that we shall endeavor to present.

Eugene W. Hilgard was born in Zweibrucken, Rhenish Bavaria, on January 5, 1833, of distinguished parents. His father becoming dissatisfied with the Government, resigned the chief justiceship of the court of appeals and emigrated to America, settling on a farm near Belleville, Ills., where Eugene had a thorough schooling in all the details of agriculture, and where he received a superior education from his father. When 16 years old he went to Europe, and studied at Heidelberg, Zurich, and at the Academy of Mines at Freiberg, in Saxony, taking the degree of Ph.D. at Heidelberg, in 1853, at the age of 20. After two years in Spain and Portugal, he returned to America, in 1855, to take charge of the chemical laboratory of the Smithsonian Institution, and lectured on chemistry at the National Medical College. In 1858 he was appointed chief geologist to Mississippi, having, however, been connected with the geological survey of that State for some years previous. As State geologist his work was vigorously pushed forward, and in 1860 was printed his report on the Geology and Agriculture of Mississippi, though not actually published until after the war. No other State report contains so much original matter, presented in such a clear and orderly manner, as this. Up to the time of the publication of this report, the whole subject of the cretaceous and tertiary of the Gulf States and of their soils was, with the exception of the information contained in the two reports of Tuomey in Alabama, practically in darkness. In the light of Prof. Hilgard's Mississippi report, the study of the cretaceous and tertiary formations of the other Gulf States becomes a comparatively easy task.

In 1860 Prof. Hilgard made a second trip to Spain and married at Madrid, the daughter of Manuel Bello of the Spanish army. During the war Prof. Hilgard was mainly assigned to the duty of preserving the collections of the University of Mississippi at Oxford, continuing also the office work of the survey, so far as his connection with the Confederate "Niter Bureau" permitted. He took a prominent part in scientific matters connected with the Confederate army, and at the close of the war resigned as State geologist to become professor of chemistry in the University of Mississippi. His interest in geology did not cease upon becoming professor of chemistry, and many of his most important contributions to the science of geology were made during the period from 1865 to 1873. We need mention only his papers on the Quaternary Formation of the Gulf Region, his Geological Reconnoissance of Louisiana, his articles on the Mississippi River and its Delta and Mudlumps, and his Geological History of the Gulf of Mexico, all of which are authorities on the subjects of which they treat.

In the Mississippi report, the soils of the State are for the first time adequately treated and this, the beginning of a long line of study and investigation of the chemical and physical properties of soils, continued up to the present time and still in progress. Some of the results of these investigations have been published from time to time, such as Soil Analyses and their Utility, Objects and Interpretation of Soil Analyses, Silt Analyses of Mississippi Soils, On the Flocculation of Particles, etc. These titles will show the position of the author in regard especially to the utility of the chemical analysis of soils, first taken in his Mississippi report, has been consistently maintained through all these years. When the Mississippi report was published, with the exception of Dr. Peter of Kentucky, Prof. Hilgard was about the only scientific man in the United States who held that it was possible to form any reliable estimate of the fertility of a soil from its chemical analysis. In the works above quoted, and particularly in the great work done by him for the tenth census, on Cotton Culture in the United States, the author has demonstrated that the chemical and physical analysis of our virgin soils, properly interpreted, together with accurate observations of the timber growth, and other characters of these soils, in their natural condition, furnish the data from which it is perfectly feasible to ascertain both their agricultural value and their proper treatment in cultivation. Hence, Prof. Hilgard is a warm advocate of agricultural surveys, for the benefit of farmers, and is constantly urging the general government to give proper attention to the bearings of geology upon agriculture, and the study of the soils in their natural conditions, while it is still possible to do so.



PROF. E. W. HILGARD OF THE STATE UNIVERSITY.

One of the results of this long and laborious series of investigations has been to carry conviction to the minds of a number of the scientific men of the country, and at the present time Prof. Hilgard has a strong support both in this country and in Europe, where his work is well known, and as much appreciated there as it is here.

An ingenious worker and expert glass blower, he constructed, himself, much of the apparatus needed by him in his lectures and in his soils investigations. His apparatus for the mechanical analysis of soils is the best of its kind and appears to have overcome the difficulties which previously made such analyses of comparatively little value. It is largely used in Germany, where that class of careful and thorough-going investigation is more frequently carried on than here.

While Prof. Hilgard was in charge of the chemical department of the University of Mississippi, laboratory work was first introduced as part of the course of instruction in chemistry. This course, though for a long time entirely optional, was taken by a number of students, some of whom have since risen to distinction, and have spread the teachings of Hilgard into other States.

In 1873 Prof. Hilgard accepted the chair of geology and natural history in the University of Michigan; but the climate proving too severe for his health, he accepted the professorship of agricultural chemistry in the University of California; and in the spring of 1875, moved with his family to Berkeley, Cal., where he has since resided.

In geology, Hilgard is a close and accurate observer, and the sagacity with which he interpreted all the facts coming under his observation, and appreciated their bearings upon the geological history of the Gulf region, can be understood only by one who has himself studied the same territory.

One of Prof. Hilgard's most important works was his report on the cotton production of the United States, made for the tenth census, in which undertaking he was given full latitude. With the aid of the State geologists and other qualified men of the cotton States, his report embraces not only the results and discussions of the census returns, but also descriptions of the physical and agricultural features of each of the 15 States concerned. These volumes exemplify the plan according to which he would have the whole country described for the benefit of the agricultural population.

Prof. Hilgard has been a frequent contributor to the scientific and agricultural press. As may be inferred, he is a man of the people as well as of science, and is an indefatigable worker. His writings are characterized by great force, and clearness of expression, and sprightliness of style that make them all pleasant reading. In conversation he is bright, animated and sympathetic.

Prof. Hilgard is a member of the National Academy of Sciences and of other scientific bodies. He has three times received the degree of LL. D., first by the University of Mississippi, next from Columbia College on the occasion of the celebration of the centennial anniversary of that institution, in 1887, and subsequently, in the same year, the same honor was conferred upon him by the University of Michigan, at the celebration of its semicentenoial anniversary.

Among the Nevada Miners.

A gentleman who returned this week from a month's trip among some of the Nevada mining camps, says that the greatest interest is being manifested among the miners concerning the cyanide process. In some camps where the percentage gained from the ore is smaller than it should be they are having hard times, and look upon this method of working ores as a great blessing. Miners all about are experimenting with the solution in a small way and are anxious for fuller information. The special edition of the MINING AND SCIENTIFIC PRESS devoted to consideratioo of the cyanide process has been looked for with great interest, as everywhere the miners were anxious for detailed information and records of experience. The interest manifested is only second to that concerning the silver bill in Congress. There was great disappointment at the action of the convention of the two great parties in the "milk-and-water" silver planks and the miners were despondent. Many of the camps are dull and the men idle, where if the free silver coinage prevailed all would be bustle and activity. Our informant said it was painful to see such a number of miners and prospectors discouraged and so many plants idle. Yet the mineral wealth of Nevada is very great, and the whole region ought to be more prosperous. But with idle mines and men, and a doubt as to value of the product of even those mines working, the prospects are certainly not good.

THE extensive production of bricks manufactured of coal dust and pitch in France may be judged from the amount stated to have been used in that country in 1889, namely, 24,000,000 tons. The coal dust is for this purpose most thoroughly mixed, in a certain proportion, with melted pitch, and then pressed into shape and afterward dried. Leaving out the cost of the dust and pitch, the bricks cost from 30 to 50 cents per ton to manufacture; the pitch is in value 30 cents per ton of bricks, and the coal about $2 per ton, carrying up the figures to some $2.70 per ton.

THE CATSKILL GRAVEL-MINING CO., near Bangor, made another cleanup recently of $1600, and was shut down 36 hours to repair engine. This company is composed of Marysville men. A. W. White, E. E. Meek, Wm. Kline, Will Greely and John Pender are the largest owners. They have only prospect machinery now, but within 90 days will have the largest mill on the Blue lead. Every one says it is the richest gravel mine known. The last yield was $20 to the ton.

EASTERN NEVADA is said to be coming to the front in mining matters. It is expected that work will commence on a number of properties this summer. A railroad from Salt Lake westward is all that is needed to make that part of the State boom.

The Mines of Calaveras County.

From our Traveling Correspondent.

Part I.

TO THE EDITOR.—The mother lode crosses Calaveras from Rohinson's Ferry on the south to Mokelumne Hill on the north in a talc slate belt. The principal mines of the county are those on the mother lode. Northeast of the mother lode is a mineralized zone, filled with innumerable small mineralized veins in the common black slate, that has never been operated to any extent. Still farther northeast a different character of mines is found, as is shown in the old Calaveras, "Right Bower"—Washington mines, where ores carry a large percentage of galena and are very high in their grade. Beyond this is a free-milling belt that has been the most extensively developed in the Sheep Ranch mine. Still farther north, the country rock changes to granite, and at West Point is found a grade of what might he called base ores that are higher in their uniform values than the ores of any other portion of the county.

Southeast of the mother lode the country rock changes to a serpentine, and in this belt is found the copper mines which are extensively operated at Copperopolis. Running parallel with this belt and on its west side there is a belt of gold-bearing quartz ledges which are developed the most extensively in the Pine Log.

GRAVEL.

Almost every gulch and stream bed paid handsomely in placer gold in the past history of the county. These old sources of wealth have long since been exhausted, but there still remains practically untouched, old river channels that by some ancient upheaval have been left sitting on the mountain tops with a covering of lava. In a few instances these old channels have heen worked to a limited extent, and the gravel found proved rich. The county still contains an almost unlimited extent of these same covered channels, the richest of which, thus far prospected, is the Blue lead extending from O'Neil's creek just west of Sheep Ranch and thence via. R. R. flat to West Point. That is the most inviting field for capital desiring to invest in drift gravel mines. As a description of all of the mines in the county would not prove of interest to the general reader, I shall confine my article to those mines which give evidence of being worked to a profit.

ROBINSON'S FERRY.

Beginning at the river bank at Rohinson's Ferry, and extending past Carson and almost to Angels, 8000 feet on the mother lode, the Calaveras Gold Mining Company, Limited, with Mr. J. H. Weston as general manager, is operating. This is an English corporation with a capital of £110,000. Tbe property is developed by a fine tunnel driven in from the south end of the property on the vein 1200 feet, showing a vein 25 feet wide in the face of the tunnel, which is here 350 feet deep There is an operating shaft sunk 365 feet near the center of the property. At this point a 20-stamp water-power mill, with an electric plant for light and pumping has been erected. The average value of the ore is difficult to determine. Tbere does not seem to be any continuous shoot, but the pay makes and breaks in hunches, very much like the old Gwin mine. Many of these ore bodies are very extensive and their value high. It is not possible, or rather not profitable, to seggregate this ore, and in consequence the entire vein is milled, which gives an average milling value of $5 a ton in free gold and 2½ per cent of sulphurets nf $67 a ton value. The quartz crushes easily, the mill averaging 2½ tons to the stamp. When the property is sufficiently developed to employ all of the stamps that the great extent and width of vein is capable of supplying this will be one of the most extensive mines in the State.

It is to Carson that we all turn when we want to bnast of the value of America's gold mines.

THE MORGAN.

Messrs. Irving & Fair, owners. This famous mine remains idle through the owners "agreeing to disagree." The mine is situated on the mother lode at the point of junction of the east and west branches. At this point or "crossing," as pocket miners would call it, was found the richest ore shoot of gold-bearing quartz in America's, if not in the world's mining history. From a block of quartz, six hy eight feet, over $3,000,000 was extracted. One piece of solid gold 108 pounds in weight, was cut off of the mass, and carries the medal to-day as the largest single piece of gold mined in America. Mr. Irving states that the gold was all connected and ran in seams about an inch thick, and that if it had been thought wortb while, the whole $3,000,000 could have been separated from the quartz as one piece of gold. Hereafter, when other sections boast of their nuggets, recollect that the Morgan of Calaveras Co. had ore of $3,0000,000. This mine has a large mill, and if the owners could in any way reconcile other differences, the mine would be a large gold producer.

THE MELONES.

This mine adjoins the Morgan. In the past, the mine was simply worked in the belt of mineralized talc, which accompanies the mother lode. In the Melones this talc was on the footwall, while on the adjoining mine, the Morgan, it is on the hanging-wall. On the Melones the talc hed was about 100 feet wide on the surface and tapered to a wedge at 250 feet. The average value of the talc was said to have heen $3 a ton. The vein proper was not worked nor developed, and the mine was closed down when this talc gouge was exhausted. Recently, the mill has been sold and removed to the Doc Jones mine.

THE CARSON CREEK MINE.

E. W. Roberts is superintendent of this mine, which is better known as the Doc Jones Mine. In the past history of the mine the property was regarded as a silver proposition, but it was not possible to make it pay as such. Recently, the mine has changed hands, and under Mr. Roberts' charge is being equipped with the former Melones mill, of 40 stamps. The mine is opened by shaft to a depth of 190 feet on a vein which runs from 15 to 20 feet in width of gold and silver-bearing ore. The vein runs from $5 to $15 in free gold and carries 3% of sulphurets of an assay value of $300 to $400 a ton. In excavating for the mill site a large vein has been uncovered which has been crosscut 40 feet. This vein is a fine serpentine slate intermingled with quartz, resembling in appearance the chloritic slate of the Father De Smet mine of Dakota. The crosscut on the vein has not reached the wall, but as depth is obtained the vein increases in mineral. A sample of the vein from this crosscut gave $8 a ton in free gold. This new discovery is 250 feet southeast of the old Doc Jones vein and bids fair to excel in value the original vein.

Leaving Carson and vicinity on the south, there is nothing in operation at this time until Angels is reached.

ANGELS.

At this point Messrs. Hayward, Hobart (deceased) and Lane have secured possession of the greater part of the mining ground and have taken hold in a way that assured a big success from the start. Their combined plant at this point is one of the largest and best equipped of any in the State. They not only own the mines, hut the water system of the county is theirs, as is also the large chlorination works of Angels. Everything that experience, ability and money can do to facilitate and cheapen the working of the mines and at the same time save the greatest per cent of the ores' value has been done. No necessary expense has been too great. The natural result is that although tbe ores are low in value, under their system of management they all pay.

THE UTICA.

This may be called the parent mine, as it was the first property taken hold of by Messrs. Hayward, Hobart and Lane. Mr. C. D. Lane is in cbarge of this and their other mines at this point, as general manager, while his snn, T. T. Lane, is foreman of the mine. On this property, two vertical shafts have been put down. The north shaft is 530 feet and the south 850 feet deep. From these shafts crosscuts have been run and drifts extended and connected at each 100 feet down to the 500-foot level. The vein runs from 15 to 35 feet in width, and is what is known locally as "a slate vein," being largely composed of mineralized talc slate intermingled with small seams of quartz. The vein is one of a number that at this point lie to the east of the mother lode and resemble feeders in small veins, with this difference, that at Angels the feeders, if they can be so called, equal or exceed the mother vein in size and value.

The plant on the mine is complete and very extensive. The mill is a model of its kind, with its 60 stamps crushing 200 tons a day, while the adjoining blacksmith, machine, electro-plating, sawmill, framing and air compressor shafts make a complete mine plant, with the system of concentrating and chlorinating added. The ores are hoisted in 15-ton skips to the top of the gallows frame. The quartz is here crushed and taken by car from the bin to the mill. The mill is in charge of Mr. Hayward's old and reliable millman, Mr. Jno. E. Reaves, under whose milling the quartz gives up everything that can be saved by the most modern system of milling free gold ores. The quartz when crushed flows over the usual amalgamating plates, then over Frues, and the tailings are conducted by a flume a half mile down the gulch to a canvas plant 85x100 feet, where all the finer mineral, that escapes from the Frues, is caught. A survey has been made to a point nn the cnmpany's ditch above Murphys, where some 300 feet nf pressure can be obtained. At this point it is intended to erect an electric plant which will furnish power for all of the company's mines at Angels and light the towns and mines as well The beauty of this scheme is that there is no waste of water, as the same stream will flow on to Angels, as it does now, and in the same ditches. At present the Utica and the company's other mines are nperated by water power secured by their ditch, the old Union ditch. Water is conyeyed by ditch about 35 miles, and tben by pipe two miles to the mines, and 400 feet of pressure secured. The 60-stamp mill and its plant requires about 300 inches a day. With electric power, the only water needed will be that of the batteries, or one inch to each battery, 12 inches in all, as against 300 now. Mining operators contemplating the erection of an extensive plant will find a visit to the Utica both pleasant and profitable.

At the Utica, the Fullen safeties and ore and water skips have been adopted, and have filled a long-felt want. I will describe these under the head of The Altaville Iron Works, where they are manufactured.

THE STICKLE.

This mine adjoins the Utica on the southeast, and is owned and operated by Messrs. Hayward, Hobart's Estate and Lane, with Mr. T. Lee as foreman. The shaft is now down 600 feet, a new gallows frame has just been erected, and a more powerful hoist is on the ground. As soon as this is in place, the shaft will be put down to 800 feet and connected with the south shaft of the Utica. Tbe company have recently purchased the Ilex mill, formerly near Mokelumne Hill, and are now adding its 40 stamps to the 20 of the Stickle, thus giving it 60.

THE MADISON.

T. Lane is superintendent of this property. It is about a half mile west of the Utica, and is on the center mother lode vein. In the past, a drift was run on the vein from the surface. The mine was bonded to Messrs. Hayward, Hobart and Lane, who erected a hoist and put down a very fine shaft. At 100 feet the vein was crosscut and showed 20 feet of heavily mineralized quartz. The shaft was then driven down to 200 feet and a crosscut run, which showed the vein somewhat broken up at this point. It is the company's intention to sink to 500 feet. In the past working of the mine, the richest shoot was found about 300 feet north of this shaft. Drifts are now being run to it from the levels. The mine has a 20-stamp mill. That this will prove a good property is already shown.

THE GOLD CLIFF.

Woodson Garrard is superintendent of the Gold Cliff, which adjoins the Madison on the north, and with some half dozen other mines on this vein is under bond to Messrs. Hayward, Hobart & Lane, though operated at this time by Messrs. Garrard and partners. In the Gold Cliff tbe ore is quarried out. The opening looks like a small valley with perpendicular walls of talc slate, filled with stringers of quartz. Several companies failed to work this property tn a profit until it fell into Mr. Garrard's hands. He soon got the cost of mining and milling down to 55 to 65 cents a ton, with his 20-stamp mill, and if he had 120 instead—which the immense size of the vein would supply—could lessen that one-half. At this point on the mother lode the vein holds no large bodies of quartz. An occasional six-inch stringer is about the largest quartz vein. Mr. Garrard has been wnrking into the foot wall, and finds it all mineralized. The opening looks to be 300 feet in width at this time. If Messrs. Hayward, Hobart & Lane once take hold of the Gold Cliff, and give it 120 stamps, tbe property will crowd the Dalmatia on its reputation of 42 cents a ton for mining and milling.

Beyond the Gold Cliff as you go north is the Hickle & Bennet and Lindsey; both said to be under bond to Messrs. H. H. & L. Still further north is

THE SUFFOLK,

Charles D. Smythe superintendent. This property contains three veins nf the mother lode. The center vein has a shaft down 80 feet, and levels run. The ore here proved to be much higher in grade than farther south on the vein. The sulphurets are richer and carry several metals in combination. The mine has a dry barrel amalgamating mill, which is said to have worked the ore up to 95 per cent of its assay value. Owing to the death of two of the principal owners, the mine has been closed down and is for sale at its cash value.

THE EXCELSIOR.

This vein is midway between the Utica and the Gold Cliff and is better known as the Johnnie Meyers Mine. The property is now heing developed under bond by Chas. Lillie, the old foreman of the Utica mine. The vein is opened by numerous cuts and shafts along the surface. It is Mr. Lillie's intention to sink on it "to where she lives," as the ore is very heavily mineralized at water level and the sulphurets go as high as $2000 a ton. There is no doubt about its proving a mine, and if it is, Mr. Lillie is the man to make it talk. Luck to Charlie!

THE EL DORADO.

This mine adjoins the Excelsior on the north and is the property nf J. Fisher. The mine is idle at this time.

ANGELS QUARTZ MINING CO.

This mine, G. H. Fox, Supt., is the property of our next Democratic Governor, Mr. Coleman. The mine is in the north of Angels and extends to Altaville. Its side lines take in a number of veins. A large amount of development work has been done on this property and the extent of the ore body is very great, but low in grade. It is thought that Mr. Coleman will erect, this season, a large mill so as to handle the property to a good profit.

THE ECLIPSE

Mine is about a mile west of Angels, and is in charge of Mr. J. M. Davis.

The property is now being developed and is opened by shaft to a depth of 110 feet. The mine has a Huntington mill. If the owners will follow the example of Messrs. Hayward and Hobart and Lane and put their shaft down to 500 feet then drive their levels and then if the mine warrants it, erect a mill, they may expect the same success to attend tbeir operations that accompanies those of H. H. & L.

THE GOLD HILL.

S. V. Ryland is president and general manager. This is the old "Osborne mine" and is just west of the Eclipse, famous in times past for her pockets. It was the amounts extracted from these rich pockets (over $100,000) near the surface, that led Mr. Ryland to purchase, as he did not believe that the gold, though found in, came out of the grass roots. The company have drifted in 700 feet, made an uprise to the surface and are now breasting out each way 30 feet with new walls reached. The vein matter is a ferruginous talc slate, with innumerable quartz crossings—which are due to the fact that in the center of this mine two large veins cross each other at almost right angles. It is Mr. Ryland's intention to sink 200 feet, unless stopped by the gold. The mine has a 10-stamp mill of 900 lbs each and crushes 40 tons a day at a cost of 57 cents a ton for mining and milling, which can be very materially lowered by the addition of 50 stamps, which the mine will soon supply.

ANGELS CHLORINATION WORKS.

Tbis plant is the property of Messrs. Hayward, Hobart and Lane and is in charge of Mr. T. M. Smith. There are two furnaces. One of 11x80 feet, and another of 12x80 feet, with a capacity of 4½ tons each, every 24 hours or 8¼ tons for the plant. At this plant a very high per cent of the assay value of the sulphurets treated is extracted. Both furnaces are kept in constant operation from the mines of the section. Tbe charges here, as elsewhere through the State, are $20 a tnn and 10 per cent off for loss.

ALTAVILLE.

Altaville is now so closely joined to Angels that it may be called a part of the same. The most famous mine of this place is the Cherokee, B. R. Priree, proprietor. The mine is southwest of Altaville about a mile. From this mine there was extracted in coarse gold over $700,000, without sinking 75 feet. The prnperty has been worked by spells for years past. About six months ago Captain Little bonded the mine, pumped it out, examined it, and announced that he would put her down 500 feet and see where all that gold came from. Once this is done the Cherokee will prove a good strip.

ALTAVILLE IRON WORKS.

Demorest & Fullen are the proprietors. These works have recently been enlarged to accommodate the fast

growing trade, and the well known mechanic, Mr. T. Fullen, taken into partnership. In addition to their general work of casting, turning, constructing and repairing, the company now manufacture Mr. Fullen's patents, the chief of which is

THE FULLEN MINING SAFETY.

Your readers will recollect that a cable parted at the drum on the Utica mine and nine unfortunate miners lost their lives in consequence. Following that accident every inventor of a mining brake came forward with his patent. Those which seemed to possess merit were closely examined and the best of them tested, but they were all found wanting. As a rule they depended on the cables parting between the nre skip and the sheave. If the cable parted between the sheave and the drum, as was the case in the Utica, the weight and consequent friction of that part or end of cable would prevent the brake from acting until the the cable had passed over the sheave. This would allow the skip to attain a velocity which could not be held in check by any brake. Either the guides would be torn out or the brake wrecked. At this time Mr. Fullen, who was the master mechanic of the Utica Co., took the matter in hand and soon had in successful operation the Fullen safety. The manager, Mr. C. D. Lane, tested the brake repeatedly and found it to hold the skip if the cable was but slacked. To test the matter beyond all doubt a rope cable was attached to the wire cable, the skip given a 15-ton load and the hoist started. When the skip had attained its customary speed the rope cable was cut squarely off and the skip did not drop 18 inches before it was held solid. So well pleased is the Utica Co. that they now have four in use, two more ordered, and will add two additional safeties for the Madison mine.

The safety works equally well in both vertical and incline shafts. The principle is that of a parachute. The increase of speed caused by breaking of cable or giving way of machinery causes the wings to rise and the dogs to grasp the guides. In this way the action is entirely independent of the cable and invariably positive. This safety is a great advance in the safe working of all deep mines and will be hailed with joy by both miner and mine operator.

Perhaps the best feature of the brake, and one that is found on no other, is the simple arrangement by which the miner on the hoist can at any point stop the skip independent of the engineer; this has already proved itself of great value on the Utica. Mr. Lane, by some mistake, was lowered into the 30 foot sump. He caught the lever and stopped the skip when the water was up to his shoulders. Without this feature nf the skip he would undoubtedly have been drowned. As it was, he barely escaped death from an after attack of pleura-pneumonia. At another time the brake on the hoist failed to act, and the miners on the skip realizing that something was wrong, stopped the skip. If the safety had no other merits, the fact that with it the skip can be instantly and uniformly stopped at any point in the shaft, by the miners on the cage or skip, is sufficient in itself to bring the safety into general use wherever mining is followed by shaft.

In addition to the safety, the Work's manufacture a water skip, ore skip and water screen. The water screen delivers its water through a side valve, by means of which the water is discharged without dumping the skip, thus saving all wear. As the skip discharges automatically, it need not be stopped at an exact point, and in consequence there is no danger of upsetting the skip. Then, too, it can be used to let its water out through any lower tunnel, as it is not necessary for the engineer to see or know its exact location. The ore skip discharges its ore the length of the car from the shaft, making it impossible for any of the ore to fall into the shaft. The water screen is a revolving screened drum which is stationary as long as the water passing through it is clear, but the least obstruction will cause the drum to revolve, and thus clear the drum. Inventors like Mr. Fullen have the mining field open to them, and nowhere will their efforts be as speedily and liberally acknowledged. I will send you some further notes on this county next week.

E. H. SCHAEFFLE.

A Theory of Illumination.

OAKLAND, June 30, 1892.

TO THE EDITOR.—Development of the theory of light has made considerable progress of late years and its true nature correctly defined; but, according to my views of the subject, scientists are still somewhat off the track as regards certain minor points, such as the illumination of opaque bodies. A beautiful analogy exists between the phenomena of sound and light. It is universally understood that both are results of the same great force—motion. Motion in the atmosphere and motion in that mysterious fluid, ether, appeals to our senses, the former to our ears, the latter to our eyes, producing the effects we call sound and light.

Now, ether is that subtle fluid filling all space, permeating all matter, the media of light-waves whereby light and heat are transmitted from the sun to our earth. There is an intense agitation and commotion of particles continually going on in the sun, and these impulses transmitted to the surrounding ether are carried on and out in ever lengthening lines until some of them strike our interfering atmosphere and we have the phenomenon of light.

Darkness, you say, is due to the absence of light, and light, we have just seen is atomic vibration; hence, darkness must be comparative passivity. Go to your room at night when all is dark and you see nothing whatever, for the composing atoms of each object in that room are in comparative rest. But now light the gas; immediately vibration is set a-going by the combustion, and passing on it agitates the atoms of every object present. You now look at matter made visible not by reflected rays, as commonly supposed, but by light-waves of their own creation, caused by the imparted energy. A luminous body is the source of etheric light-waves, while an opaque substance is made visible by the presence of a luminous one.

Light is as much more subtle than sound, as ether is than air, and the general truths of the one apply to the other, and vice versa; hence, in tracing the analogy we discover a beautiful correspondence between sympathetic *sound* vibration and light illumination, which we at once see is nothing more than sympathetic *light* vibration. The rays of the sun reach the side of the moon visible to us, creating among the atoms of that body, a violent agitation. When they strike, their office is fulfilled, their motion has been checked and they cease to be. But now the commotion of the moon's particles imparts its energy to the surrounding ether and thence to us, giving us the delightful evenings of full moon. Give credit where credit is due, give the honors to the moon and stop heaping them upon her big brother, sun. She vibrates in sympathy with his vibration, the analogy here being perfect—stop the source of the sound and there would be no sympathetic vibration from a neighboring instrument; refuse the moon the presence of the sun and she would ever remain invisible.

In the particles of most matter composing opaque bodies, sympathetic vibration ceases the moment the luminous one is removed, the atoms returning to their original comparative passivity. Some substances, however, are exceptions, such as the sulphides of calcium, strontium, etc., which retain, for a short time, the imparted energy. It is to these substances we attach the name, phosphorescent.

This somewhat meager outline of light propagation may be profitably extended in all the various phenomena of light with interesting results. We are not yet at the end of the tether of discovery, many startling facts await our persevering efforts.

L. T. M.

The San Francisco Meeting of the Mechanical Engineers.

The degree of success attending the recent meeting of the American Society of Mechanical Engineers, at San Francisco, may be estimated in various ways, says the *American Machinist*.

If it were to be considered solely upon the basis of attendance of members it could not of course be counted a very highly successful convention, for out of a membership of over 1400, less than 50 members actually attended, which seems like a very small attendance, though when compared with the usual attendance of about 100, it does not seem so small.

But we do not think the success of the meeting should be estimated upon that basis alone, for there are other things to be considered. The society is not a local one; it is not the Eastern or the Central or the Southern Society of Mechanical Engineers, but the American Society, in which all mechanical engineers in the country, no matter whether located in Maine, Texas or California, are supposed, and, in fact, invited to take an interest, and become members.

Now, having a membership scattered all over the country, and hoping to draw a still larger membership from all parts, the question arises how best to serve their interests in regard to the place of holding meetings.

If it were a matter simply of minimizing travel to and from the conventions, the place of holding them would be determined something as the "center of population" is determined from the census returns, and the meetings would then all be held, say at Pittsburg, or at Baltimore, or possibly New York.

But it is morally certain that such an arrangement would not suit the majority of members so well as the present arrangement, nor would it be so fair to the membership at large, for it would entirely relieve some of them of the necessity of traveling to and from the meetings, while others would invariably have to travel thousands of miles to attend, and all of them would see the very same city or section of country each time, without the opportunity for studying the engineering of the country generally, which the present plan affords, and which is so beneficial to an engineer.

It is observed that a meeting held in a section of country previously unvisited always results in a considerable accession of membership from that section. It is quite certain that San Francisco will be no exception to this rule, and that some valuable names will be added to the roll as a result of the meeting there—names of men who can, and probably will, by professional papers or otherwise, give to other members of the society much that will be of great value to them.

Of course it cannot be that meetings will be held as often in remote places as nearer the industrial centers, where the bulk of the membership is found, but there can be no question but that the entire territory from which members have been, and are to be drawn, should be covered by the meetings, the fall meetings—always held in New York—being a fair concession apparently to the minimum travel theory, and this made fair only by the fact that most engineers want to—and, in fact, must—visit New York occasionally, because it is the engineering as well as the commercial center.

It will probably be many years before the society will again go so far as the Pacific coast, but, if it should go again, it is probable that improvements could be suggested in the itinerary; it seeming rather strange that a body of engineers should pass through or very near to such places as Denver, Pueblo and Virginia City without visiting them. The failure to see these places must be attributed to the fact that the schedule was arranged almost solely by excursion agents, who are in the habit of arranging them for the ordinary tourist wishing to see only the regular wonders mentioned in guide books. Such a new schedule would almost inevitably involve more time, however, for it is safe to say that no feature of the recent trip would be willingly sacrificed—certainly not by the advice of those who were members of the recent party.

If it should so happen that a meeting should be held at, say Denver, within a year or two, many points of great interest to engineers, which were missed on the recent trip, could be visited, it being understood that next spring's meeting is to be at Chicago.

Most of the members of the society are, of course, busy men, and find it impossible to take the time necessary for such extended trips as the recent one, but such trips do not occur often, and there are, we think, many excellent reasons for taking them occasionally.

New Tax on Mines.

A plan for a new tax on mines has been submitted to Congress by the Department of Finance in connection with the new mining law which was outlined in these columns in our issue of April 30th last, and which, with unimportant modifications, has already received the sanction of the Legislature. By payment of the new tax, mine owners will enjoy absolute and undisturbed possession of their properties, free from the annoyance of "denouncements" and from the tiresome, and often expensive, administrative formalities necessary to obtain an "amparo," or temporary exemption from "denouncements."

In substance the bill is as follows:

Art. 1. A federal tax, guaranteeing the absolute ownership of mines, is created. The tax in question consists of two parts, one being payable on the title-deed once for all, and the other, annually, with respect to each claim or pertenencia (defioed by the Law on Mines to be a square of 100 meters to the side, described on a horizontal plane without reference to the inequalities of the ground) which the property contains.

Fractions of a pertenencia exceeding one-half are to pay the entire tax, and those less than one-half nothing at all.

Art. 2. Every mine-owner is bound before October 31st next to present his title deed to properly authorized representatives of the Department of Finance, in order that stamps to the amount of the tax may be affixed to such title-deed, and, at the same time, to declare the number of pertenencias comprised in his property.

The title-deeds which the Department of Encouragement is to issue, according to the new Mining Law, are to bear stamps furnished by the concessionaire, according to the number of pertenencias covered by the grant.

Art. 3. The denomination of the stamps in question is to be $10 and they are to be attached to title-deeds at the rate of one stamp per pertenencia.

On titles issued up to 30th June next the stamps are to be cancelled by the Department of Finance; on those issued subsequently, by the Department of Encouragement.

Art. 4. After July next a tax of $10 per annum is to be paid on every pertenencia, or fraction thereof as explained in Art. 1, of which a mining property consists.

This tax is to be irrespective of the nature of the substance extracted from the mine.

The holders of special zone concessions are to enjoy exemption from the title tax and the annual tax, but only while their concessions remain in force. The present zone grants will not be renewed at their expiration, and the mines which they cover will then come under the general provisions of the new law.

Art. 5. The annual tax is to be paid in advance in triennial installments. Mine owners are required to appear in the Federal Revenue Offices, hereafter to be designated, to pay the taxes for which they are liable, in the first month of each triennial period, without need of notification.

Art. 6. For each period of two months which the presentation of the title-deed is delayed after the expiration of the time allowed by Art. 2, a fine equal to the amount of the stamps required to be affixed to such title-deed shall be imposed.

Concealment or misstatements as to the number of pertenencias shall be punished by the imposition of double taxes, i. e. of double the amount of the original title tax and of double the annual tax for the entire period for which the regular amount should have been paid. These penalties do not relieve the defaulter from criminal or civil liability in the case.

Failure to pay the annual tax in the first month of each triennial period will be punished by a fine equal to 50 per cent of said tax, if payment be made in the second month, and by a fine equal to the tax itself if payment be made in the third month. At the expiration of the third month the right to the mine lapses, and an announcement to that effect will be published in the *Diario Oficial*, so that other parties may make application for the forfeited property.

Art. 7. Parties selling mines must notify the proper authority of the change of ownership. Deeds of sale must bear the stamps required by the Ley del Timbre (stamp law.)

Art. 8. Parties desiring to give up the operation of a mine or mines must notify the Department of Finance, when their taxes will be assessed and collected up to the date of such notification.

STOCKBROKERS' SEATS.—The Mayor and Supervisors, acting as a Board of Equalization, have been considering the request of the San Francisco Stock Exchange Board to have the seats of its members assessed at $50 each instead of $2500, which was the figure arbitrarily given by the assessor. Attorney Ackerman, for the Exchange, argued that the taxable value of the seats should be merely the difference between the pro rata shares of the realty owned by the Exchange and the selling value of the seats in the market. The realty was assessed at a rate which made the shares worth $2700 each. The value of the seats, as fixed by recent sales, was only $2500 each, and there was therefore nothing to tax. George T. Marye, Jr., stockbroker, was willing to have his seat assessed at $50, although he considered the position taken by the attorney the sound one. Jacob Greenebaum coincided.

Amador County Miners' Association.

The fourth monthly meeting of the Amador county miners' association was held on recently in Jackson. Owing to the fact that no notice had been given of the meeting, there was but a small attendance.

The president, J. F. Parks, took the chair and called the meeting to order. John R. Tregloan spoke in reference to the effort made to get a rock-breaker for Amador county, with the object of effecting an improvement in the roads of the county. The mining industry was greatly interested in securing good roads. The prosperity of the county depended in a great measure upon this matter; he therefore moved the following resolution:

That this association indorses the proposition before the board of supervisors to purchase a rock-breaker by the county, for the purpose of furnishing broken rock for the repair of the public roads, and urges the board to adopt said proposition at the earliest possible moment. Carried.

James Meehan stated that the reason why so few from Jackson were present was because it was not generally known. Had the meeting been properly advertised there would have been a good turnout.

Mr. Tregloan said he understood that at the first meeting of the association a resolution was passed giving all the printing to the paper in Sutter Creek. Such action was not proper, and he thought the resolution ought to be rescinded.

R. Webb said that he was informed the day after the first meeting, by one who was present at the organization, that a resolution of this kind was adopted for the reason that the *Record* was the only paper represented. As far as the financial effect was concerned he cared nothing, but he did think the action was an uncalled-for slap at the old-established papers of the county, and so long as it remained upon the minutes as the expressed voice of the organization he could do nothing to further its interests.

The chairman said the motion referred to was made in the hurry of adjournment, and after a motion to adjourn had been carried. It was clearly out of order, and although put and carried, it was looked upon more as a joke than anything else.

The secretary, A. B. Call, said the resolution had no place in the official minutes, and the association was not bound by it.

A recess of ten minutes was taken, during which several names were added to the membership, bringing up the total to 261.

The committee on a code of mine signals was granted one month's further time to report.

It was decided to hold the next meeting in Jackson, on Thursday, July 21st, at 7:30 P. M., to which date the meeting adjourned.

The hour was changed to the evening so that the miners might attend. A large attendance is looked for, and the objects and advantages of the association will be explained.—Amador Ledger.

Mining Congress.

Railroad rates to the Mining Congress which convenes in Helena, July 12th, have been definitely settled. There was a disagreement in the Trans-Missouri Association, and the Executive Committee of the Congress commissioned its secretary, B. Brown, to go East and endeavor to adjust the same, which mission has been successfully accomplished, as appears from the following special from Mr. Brown to the *Journal:*

CHICAGO, June 10.—Advisory board of the Western Association, on appeal, has to-day overruled Trans-Missouri Association, and one fare for round trip for the National Mining Congress is now firmly established. BARNARD BROWN.

This favorable action on the part of the railroad assures a large attendance to the Congress, which will prove the leading feature in this season of conventions in Helena.

SOUTHERN LINCOLN.—About six miles from the mouth of the Vegas wash, some very promising mines have been struck. The Red Rover mine, owned by J. B. Wilson, McClannahan and H. Wiser, is a very promising prospect. The croppings are traceable 4500 feet, showing a ledge for that distance which will average eight feet in width, and in some places the croppings stand up 75 feet in height. Assay was made of the croppings which went, silver $6.70, gold $7.50 and 33 per cent lead. A shaft 50 feet deep has been sunk on this ledge which greatly improved as depth was attained, and a fine body of ore is now exposed at the bottom. The Wilson and Blue Bell claims, situated close by the Red Rover, promise to be good ore producers in the near future, the ore going about 70 per cent lead and carrying gold and silver in paying quantities.—Pioche Record.

Machine for Sizing Ties.

Tie making is an important part of the work of saw mills in Oregon and Washington. The work of sizing ties has always been a laborious task to mill-men heretofore, but now a machine has been invented to do this work, which is being used at the West Shore Mills at Astoria, in getting out ties for the Portland and Astoria Railroad.

Speaking of this invention, the *Astorian* says that the ties are 8x7 inches, and ten feet long. When placed in position for tracklaying, these ties rest on six 8-inch stringers running lengthwise with the track. It is necessary that all should be of the same height from stringer to upper surface of the tie, and also should have a firm hold on the stringer This necessitates the cutting of six 8-inch slots in the tie of different depths, according to the variation in the diameter of the timber. Formerly this work was done on a planer, one slot at a time being cut, which, aside from consuming a great deal of time, was also very expensive. To obviate this, and turn out ties more rapidly, Mr. J. C. Trullinger has built a machine which does the work perfectly, and with rapidity. A carriage mounted on four 6 inch wheels, with flanges, riding on two ∧ iron tracks, is worked back and forth at will by means of a ratchet and gear underneath, connected with a crank at the side the operator stands. Suspended from the floor beams overhead by massive timbers is a two-inch shaft, running in the journals of four heavy cast-iron hangers. On this shaft are keyed six knife heads, each carrying two blades. The knives are the exact size of the slot to be cut in the tie, to wit, 8¼ inches, and the heads are placed at the distances one from the other that the stringers will be laid. This knife shaft is driven by a 10-inch pulley, connected with a counter shaft, and makes 2000 revolutions a minute. The operator places six ties on the carriage side by side, and grasping the crank moves the carriage up until the knives come in contact with the upper surface of the ties. The ties are held firmly down on the carriage by two levers weighted at the end, and placed one on each side of the knife shaft. As the knives strike the wood, the carriage is moved forward by means of the ratchet and crank, and in about three minutes the slots are cut out, and every tie is of exactly the same dimensions. It is a wonderful labor-saving device. A patent has been applied for.

ARE ELECTRIC STATIONS MANUFACTORIES?—We should say not, if the term is used in its ordinary sense and acceptation. A steam engine is not a manufactory; neither is a water-wheel or a wind-mill. All these deal with force, transforming and adapting it to a useful end. But within themselves they manufacture nothing, though they may furnish the motive power by which manufacturing is accomplished. It does not matter, so far as the principle is concerned, whether steam or electric energy is generated. If either is applied to the production of a commodity, we have then a manufacturing industry, but not otherwise. The question is not a frivolous one, nor an abstract speculation merely, but has been raised on very practical grounds, there being a discrimination in the tax laws of some localities between manufacturing and other kinds of business. When such a distinction is made, it is usually in favor of manufacturing, which all communities are disposed to encourage. Taking the common sense view of the matter, which, after all, ought to be decisive, an electric station should be admitted to any favor of this kind as much as a rolling mill or a piano factory. Whatever its status may be in a literal or technical sense, it bears precisely the same relation to the public interest, to growth of population and increase of wealth, and should be dealt with accordingly. The law ought to conform, if the lawyers can afford to permit it to do so, to the obvious merits of the case.—*The Mechanical News.*

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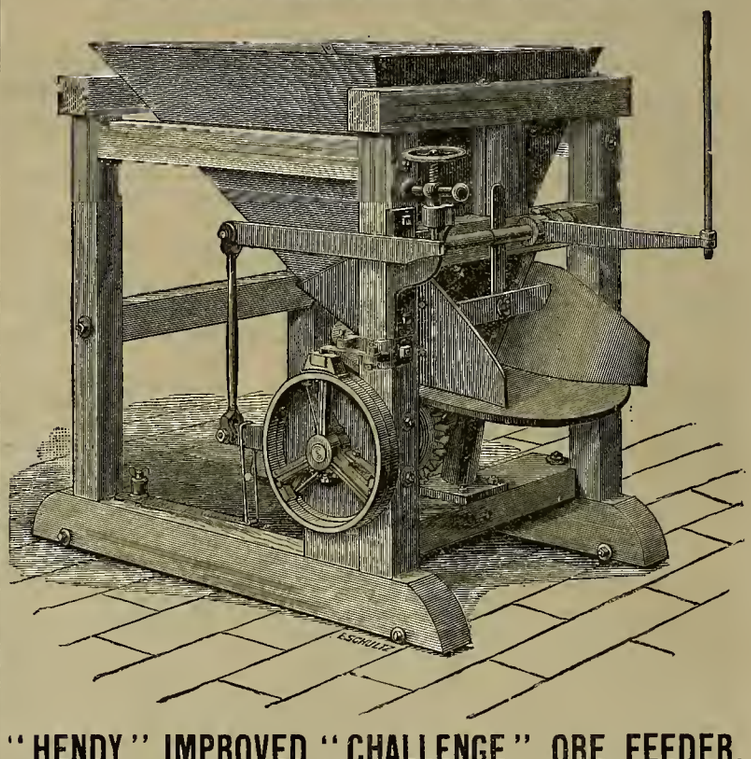

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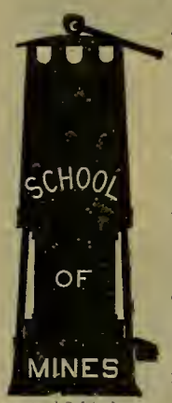

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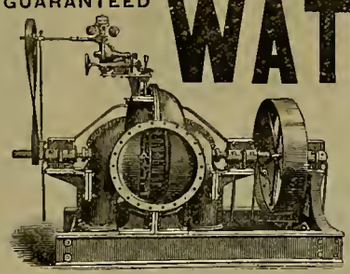

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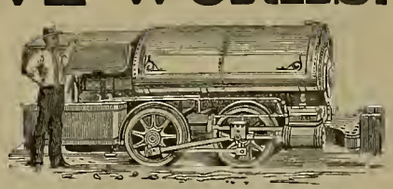

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MECHANICAL PROGRESS.

A STEEL CHIMNEY.—One of the most notable achievements in the rapidly multiplying applications of steel to structural purposes is the new chimney of that material in Chicago, the dimensions as given being a height of 250 feet, with an outside diameter of 9 feet 5″, while the steel varies in thickness from 5-32″ at the top to ⅜″ at the bottom. The lower 75 feet of the chimney is lined with firebrick 8″ deep, formed to fit the shell compactly all around, and above this is lined with hollow tile. This lining is supported at intervals of 25 feet by an angle iron riveted to the steel shell—that is, the chimney is lined in a manner similar to blast furnaces and foundry cupolas, no expansion by heat being able to lessen its strength, and the joints are all hot riveted. The steel shell is carefully protected from corrosion and from any attacks by the weather by painting inside and out. The weight of the chimney is spread to the foundations in the same manner or general way as that of the columns of the building, the base or foundation on which it rests being constructed similarly. The ground, first, is covered with a layer of cement, then two layers of steel rails in cement and one layer of I beams, on which the cast-iron shoe which takes the shell of the stack rests. The capacity of the chimney is twelve 60″ boilers, 20 feet in length. The outside diameter of this chimney is 9 feet 5″, while were it constructed of brick, it would be 16 feet 6″. Scientific Machinist.

WIRE GLASS.—Under the name of wire glass, a new invention has been brought on the market by a Dresden firm which marks an important development in the glass-making industry. The process of manut facture consists in furnishing glass in a hoplastic condition with a flexible metallic layer, iron wire netting, for instance, which is completely enclosed by the vitreous substance and effectively protected against exterior influences, as rust, etc. The new glass, which has been patented in the leading countries, possesses much greater resisting power than the ordinary metal, and is, it is claimed, indifferent to the most abrupt changes of temperature, and will even withstand open fire. A further proof of its toughness and durability is stated to be the fact that it may, in a highly heated state, be sprinkled with cold water without being materially damaged. The glass is specially adapted for skylights, the powerful resisting qualities of the material enabling the usual wire protectors to be dispensed with. As wire glass cannot be cut by the diamond, except under the application of great force, and cannot be broken without creating considerable noise, the substance is claimed to be, in a measure, burglar-proof.

DIRECT PROCESS.—Strange as it may sound to many who have not carefully followed the progress recently made in the iron and steel industries, iron puddling promises to soon become one of the lost arts, or at least, to be reduced to very insignificant proportions. By the direct process, steel is now made with but a small percentage of the labor that must be employed to produce iron through the process of puddling. So great is the saving in this regard that steel is already cheaper than iron. On this account, and by reason of its greater value for most uses, it is fast superceding iron. It is predicted that in a very short time it will almost entirely supplant iron in the manufacture of almost all forms of agricultural implements and machinery, and in scores of other great manufacturing interests. The wages of the puddler are already very low, and must now suffer another cut. If iron is to compete with steel at all, wages must soon be reduced to a point at which men cannot afford to labor. The age of steel has indeed arrived, and the puddler will soon find his occupation gone.—Chicago Journal of Commerce.

STEEL wire seating for railway car seats is being used in England, and is said to be taking the place of the padded and volute spring seats. The new seat is composed of minute steel wire rings compactly knit together, over which only a thin layer of hair or a pad of felt is necessary. The London & Northwestern Ry. has already fitted 653 to car seats and sleeping car berths, while the Great Eastern Ry. has in use nearly 5000.—Engineering News.

THE new insulator termed chicle, is produced in the States of Campeche and Yucatan, Mexico. Chicle, the sap of the sapodilla tree, is extracted like camphor, india rubber and other gum; it is an insoluble substance, and it is said to be now used extensively as an insulator.

USEFUL INFORMATION.

TESTING EMERY WHEELS.—A mechanic recently learned a lesson about emery wheels by nearly getting killed by the bursting of one of them. The wheel was left running while he went out of the room on an errand. As he came back, a piece of the wheel came to meet him, passing within a foot of his head. Luckily no damage was done except to a window, the sash and glass of which went out of doors in company with the broken wheel. There is no need of having such a thing happen. Let a man take an emery wheel in his hand, place the forefinger of his left haud in the mandrel hole of the wheel, with a small wooden mallet (never use a hammer) tap the wheel lightly, and note the sound given forth by the blows. A crack can be quickly detected in this way, and if every wheel was thus tested when it came into the shop, and if the practice were followed up every time a wheel is placed upon the mandrel, there would be no accidents from broken emery wheels.—Woodworker.

CYPRESS TIMBER.—Cypress timber grows very tall, straight and thick, in isolated patches or groups called "brakes," in the shallow swamps, lakes and bayous, usually in from one to five feet of water, and, under favorable conditions, attains an enormous size. The trunk is straight and without limbs often to a height of 75 feet or more, and large trees measure 120 feet in height and 25 feet and over in circumference about the base, which at the ground is often three or four times the diameter of the trunk. Authorities disagree as to the varieties. some claiming that there are three kinds—red, white or yellow, and black—while others claim that they take their names from the color of their heart wood, which varies according to soil and conditions. The white or yellow variety grows largely in Arkansas, while the red and black varieties are found in Louisiana and other Gulf States.—West Coast Lumberman.

INDIA RUBBER PAVEMENT.—A German engineer has paved a bridge with india rubber, and the result has been so satisfactory that it is to be applied on a larger scale. It is found to be more durable than asphalt, and not slippery. "A section of roadway," says the *Railway Review*, "under the gate leading to the departure platform of the St. Pancras terminus, London, has for some years past been paved with india rubber, and many people must have been pleasantly surprised at the deadening of souod when passing over it on wheels, and at the grateful elasticity to the tread when traversing it on foot."

A SEWING MACHINE has been invented which stitches easily and rapidly through layers of leather five-eighths of an inch in thickness, this having been accomplished on a first exhibitory trial; in a second trial, stitches were made evenly and rapidly through a piece of bird's-eye maple three-eighths of an inch thick, and in a third test, the still more remarkable feat was achieved, viz., that of sewing through a layer of brass one-eighth of an inch thick, placed between pieces of leather.—Manufacturers' Gazette.

GLASS BRICKS.—For some time past, transparent glass bricks have been let into the walls to afford light at places where a window would interfere with the architectural plan. But now it is proposed to cast glass, not necessarily transparent, into large blocks for buildings. The material is practically indestructible, perfectly nonabsorbent, and, therefore, damp-proof in a manner which few bricks are, and in this way coarse glass of this kind could be made nearly as cheap as concrete, stone or baked clay.

A DOG belonging to Hercules Tyrius was one day walking along the seashore, when he found and ate a murex, a species of shellfish. Returning to his master the latter noticed that the dog's lips were tinged with color, and in this manner Tyrian purple was discovered. The color was used in the robes of emperors and nobles, and the expression "born to the purple" meant that the person was of high birth.

A CORRESPONDENT of the *Lancet* cites a number of instances in which the appearance of influenza immediately followed the receipt of a letter from an infected place. He thinks the source of the infection was the saliva used to moisten the postage stamp.

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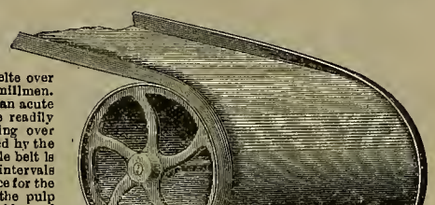

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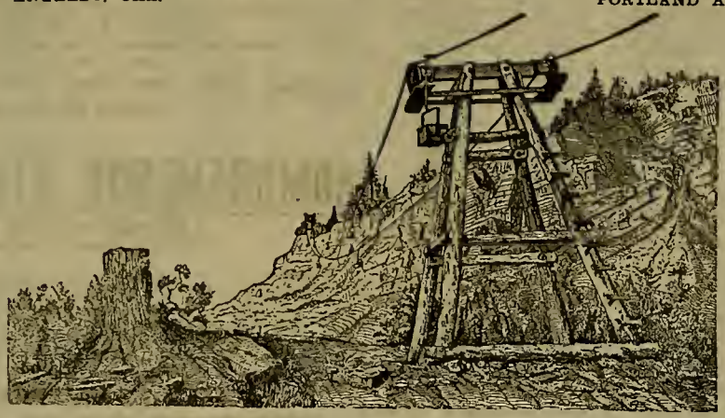

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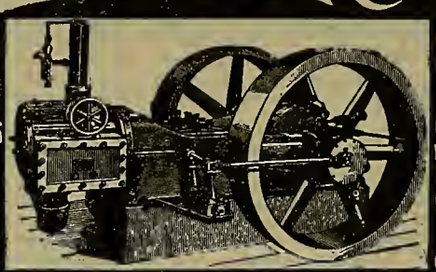

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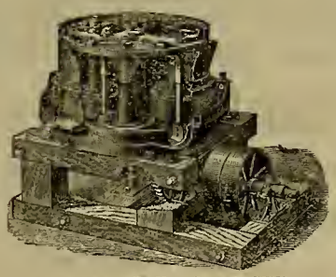

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Fiber Graphite.

Fiber graphite, which was invented some two years ago, appears to he rapidly acquiring prominence as an antifriction material for journal-bearings on account of its valuable property of dispensing with oil as a friction-reducing agent, thus eliminating from all machinery plants a considerable item of expense. Fiber grapbite is composed of two materials—hardwood fiber and grapbite. It is manufactured by the following process:

Hardwood fiber is reduced to a pulp; graphite is then added in a powdered state, and this material is taken to a mould, which consists of an iron box or tub, witb several very small boles in the bottom. Tbe wood fiber and graphite are placed in this mould, water is added, and bydraulic pressure is applied. The compression causes the water to escape by the boles in tbe bnttom of the mould, and in its outflow it causes the wood fiber to take a perpendicular position; and as the wood fiher prevents the graphite from escaping, the latter is compressed between the fibers, which are tbemselves coated with plumbago, and the result is a dense mass of fiher graphite. When taken from the mould, the material is in a finished condition, and has a very smooth satiny surface. After heing removed from tbe mould, it is dried in tbe atmosphere for a short time, after which it is thoroughly saturated with purified linseed-oil and haked in an oven. This last operation leaves the substance ready for use. The wood fiber, in taking a perpendicular position, presents the ends of the fibers to tbe shaft, thus reducing tbe wear on the journal. In the form of a journal-bearing, fiber graphite is a solid lubricant, plumbago being one of the best lubricators known. The first few turns of a sbaft in a fiber-graphite journal fill the pores of the steel, and also give tbe shaft a very tbin coating of the new material.

Spontaneous Ignition of Wood Pulp.

Some interesting experiments were recently made in Boston by Edward Atkinson, to determine some questions relating to the spontaneous ignition of wood pulp. According to an exchange, the experiments were made in an Alladin oven, with a thermometer to indicate tbe temperature. Two slabs of wood pulp were tied in tbe oven, one in contact witb a loose iron sbelf, the other without any contact. The first ignited at 370, the last at 430 degrees. In two previous tests, the oven was open wben tbe thermometer reached 425 degrees, but the pulp did not take fire until the introduction of air, when it ignited instantly. In speaking of tbe matter, Mr. Atkinson says:

"We have been able heretofore to imitate spontaneous combustion by putting animal or mineral oil on fibrous substances; we have tried experiments by mixing mineral or paraffine oil with animal oil to determine the exact point or proportion at which the paraffine or mineral oil will prevent oxygenation of animal or vegetable oil, but there has been no apparent means of making this oxygenation visible until tbe present test. This test may explain the cause of many fires. Heretofore there bas been no knowledge of the ignition by rapid oxygenation of a highly heated substance, mostly carbon or almnst pure cellulose, witbout any admixture of grease or chemical. It would appear that finely divided and moderately beated carbonaceous material, holding air in its pores, may ignite at a relatively lower temperature than ordinary wood. It would seem well, therefore, to avoid the use of sawdust for sweeping floors, and its storage near bot kitcbens. Ice bouses are known to be bad risks. A little gudgeon grease in the sawdust is said by some to explain tbe reason."

PASTEURIZED MILK.—All methods of sterilizatioo that are in use in this country have the disadvantage of giving to the milk the taste which is peculiar to boiled milk, and also of rendering it less easily absorbed by the body. In France and Germany a method has been adopted which accomplishes the purpose without injuring the taste of the milk. Machines are in use in Paris and some otber cities which will heat great quantities of milk to a temperature of about 155° Fahr. for a few minutes, and tben cool it rapidly to a low temperature. The method has been called the pasteurization of milk. It does not kill all the bacteria, but it does destroy so many of them that it greatly increases the keeping properties of the milk. Moreover, it almost entirely destroys tbe danger from disease germs in milk, since nearly all forms likely to occur in milk are killed by this temperature. The advantage of this metbod is that the temperature of 155° Fabr. does not give to the milk the taste of boiled milk, which most people find unpleasant, and does not render the milk difficult nf digestinn. These pasteurizing machines have not yet been introduced into this country, and the opportunity exists for some one to develop a thriving business by furnishing pasteurized milk in our large cities. A little experience with its superior keeping properties, and a little knowledge of its great wbolesomeness, would soon create a demand for it in America, as it has already done in the larger cities of France and Germany.—Prof. H. W. Conn in Popular Science Monthly.

THE ALBERT MEDAL.—Mr. Edison has been awarded the Albert Medal of the Society of Arts for the present year, in consideration of tbe distinguished services rendered by him to the progress of electric-lighting, telegraphy and the telephnne. This medal was instituted in 1862 as a memorial of the Prince Consort, for 18 years president of the society, and is awarded annually for distinguished merit in promoting arts, manufacturers, or commerce. It was first awarded, in 1864, to Sir Rowland Hill, and among the distinguished men of science wbo have since received it are included the names of Faraday, Wbitworth, Liebig, Lesseps, Bessemer, Siemens, Armstrong, Thompson, Joule, Hofmann and Helmholtz. In 1887 it was presented tn the Queen on the occasion of her jubilee. This is the second occasion on which it has been awarded to an American. In 1884 it was given to Mr. (not, as is often stated, Captain) Eads, in recognition principally of bis great engineering works at tbe mouth of the Mississippi.

MAGNETIC PROPERTIES OF ALUMINIUM IRON.—Two pieces of metal containing respectively one-balf and one-eighth per cent of aluminium alloyed with cast iron were recently tested by Mr. C. Eickemeyer at the laboratory of Cornell University, the results of which were published in *The Crank*. The Eickemeyer differential magnetometer was used in the test and the aluminium iron was balanced with a test piece of Norway iron, tbe magnetic characteristic of wbicb was known. The properties of these twn, however, were sn very similar that more accurate results were obtained by comparing tbe aluminium iron witb a piece of cast iron which had already been tested by comparison with tbe standard Norway iron. In the test the piece contalning the smaller per centage of aluminium proved to be superior. The aluminium has no very marked influence upon the magnetic conductivity of cast iron, but slightly decreases its permeability.

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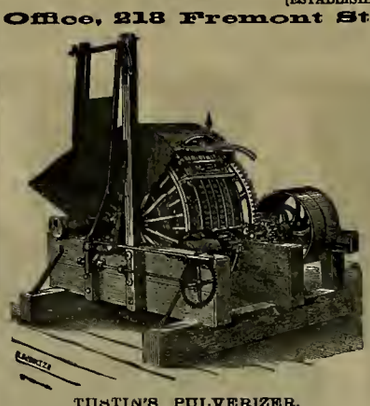
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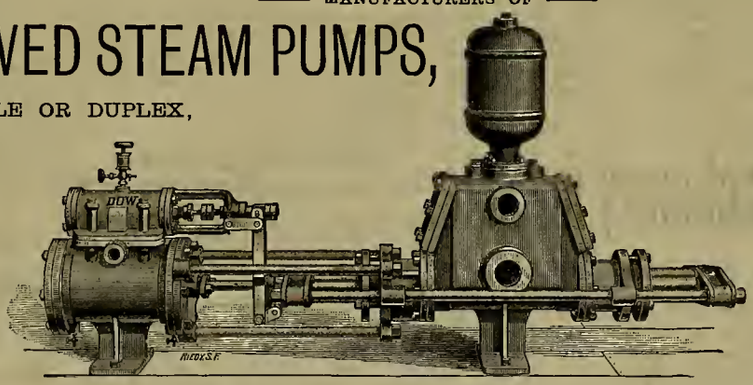

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ELECTRICITY.

Storage Battery Traction.

In a recent paper read before the Franklin Institute, Mr. Salom reviewed the present status of the storage battery system of electric street-railway propulsion. He summarized the subject under the following heads: First, why is it that so promising a field in electrical engineering has as yet produced no adequate commercial results? Secondly, what definite knowledge has been gained by the trials and failures of the past? Tbirdly, what are the prospects of the future for the introduction of storage battery traction? Regarding the first, he said patent litigation was largely responsible, as capitalists did not like to invest in a plant whicb might subsequently be adjudged an infringement. Until the patent question was decided, the companies in litigation were hardly in a position to construct elaborate experimental plants. Regarding the second heading, he reviewed the various problems which come up, and reported a case where a single set of accumulators made over 6000 miles before tbe plates gave out; this was on a road in Indianapolis. Assuming that a battery could make 100 miles a day, this means a renewal every 60 days, wbich, he says, represents a cost of operating of about 3.85 cents per car mile for battery depreciation. He states that there have been no improvements so far whicb diminish the number and weight of tbe batteries. Under tbe third heading, he states that the introduction of storage traction for surface roads in our large cities is inevitable, and that the trolley may be introduced at the present time, pending the solution of the difficulties under which storage batteries have come into disrepute, but, in the long run, the obvious advantages of the storage system must be recognized. He claims that there are no insurmountable difficulties beyond the fact that it costs a few cents a car mile more than the trolley, and, when the public recognizes this, the introduction will be inevitable. He deduces the fact that the additional operating cost of the batteries system over the entire cost of the trolley system does not exceed four or five cents per car mile, which represents the saving on the West End road of electric traction over horse traction, namely, the difference between 21 and 25 cents per car mile; this brings storage battery traction up to the cost of horse traction, but the advantages over the latter are so great that they cannot fail to be recognized. All the slander and ridicule that have been heaped upon storage batteries, he says, does not alter tbeir capacity to do a certain amount of work for a given cost per watt bour. "Give the storage battery a chance, and let tbe same engineering skill be applied to the storage system as has already been done with the trolley, and tbe results will be surprising." We agree with Mr. Salom in most of the statements which he makes, more particularly witb tbe last sentence, to the effect that if the same amount of money, energy and attention were given to storage battery traction as bas been given to the development of the trolley system, what are now difficulties would readily be overcome. Although the advantages of the trolley over horses are unquestioned, yet there are special cases in the hearts of cities where overhead wires are objectionable, at least if there is a possibility of being able to do without tbem, and it is tbis field which the storage battery and the conduit system are destined to occupy sooner or later.—Chicago Journal of Commerce.

AT THE WORLD'S FAIR.—Sunday's issue of the New York *Herald* contains an article on the World's Columbian Exposition. Speaking of the electrical features of the Fair the article says: Twenty years ago little was known of electricity outside of the telegraph. At this exposition it requires a building of nearly six acres to hold the different electrical inventions, and Edison alone will use up about an acre of space. An electricity firm of Berlin wants nearly an acre, and this firm has offered to spend $200,000 on its electrical exhibit. Edison is getting up new matter for the Fair, and he proposes to show his kinetograph and other things which will be new. The exhibition of electricity in lighting and in power production will be shown in the different buildings in a way never dreamed of before. The electric plant of the World's Fair will cost more tban $1,000,000, and electricity will turn night into day. The electrical water display will surpass anything ever attempted. The great basin which runs from tbe lake to the Administration building will be encircled with electric lights, and lights will be sunk under the water, and the effect will be a lake of gold. The fountain will flow over electric rays of all the colors of the rainbow, and there will be search lights, arc lights and all sorts of electrical appliances, even the most wonderful fireworks operated by electricity and made to go off by the playing of the keys of a piano-like instrument, so that they will change at the will of the player and produce wonderful fire pictures.

RAILWAY ELECTRICITY.—The meeting of the railway superintendents, held in Denver, Col., served to bring out strongly tbe intimate connection, in many ways, between the modern railway and the electric current. Beyond the now indispensible adjunct of the telegraph, the electric signal and many minor applications, railway managers are brought face to face with that larger and more important subject of electric traction, and it is well that Mr. Charles Selden drew the attention of his colleagues to matters which they may be called upon, at any time, to seriously consider in their daily work. The figures he gave as to the relative proportion of net profits to operating expenses of steam and electric roads were very significant as showing the greater remunerativeness of electric railways. To be sure, the traffic of both is somewhat different in its nature, but even to-day suburban roads, which are now barely paying expenses, as Mr. Selden pointed out, could be made profitable, and we are glad to learn that if the experiments about to be undertaken by the Baltimore & Ohio road, at Baltimore, in the application of heavy locomotives to the hauling of their trains through the tunnel proves successful, it will be followed by the converting of the suburban steam road of the Baltimore & Lehigh Railroad into electric. The prospects and limitations of electric railroading on the standard-gauge roads as discussed from a mechanical and electrical standpoint in Mr. Frank J. Sprague's inaugural address, before the American Institute of Electrical Engineers, in Chicago, must be viewed with satisfaction by all electrical engineers interested in the progress of electric railroads, inasmuch as the conservative tone adopted by Mr. Sprague will serve to instill confidence in the minds of many who are prone to look upon the somewhat visionary schemes of some electrical promoters as the prevailing ideas of the general body of electric railway engineers.—Electrical Engineer.

THE experiment of the killing of cattle by electricity will soon be tried at the Aberdeen abattoir, where the electric plant is now being installed. If the experiment proves that this manner of killing cattle has no bad influence on the quality of the beef, the application of electricity will hereafter be general.

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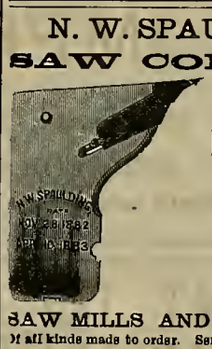

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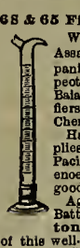

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MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

KENNEDY.—*Ledger*, July 2: They are putting up new sulphuretz works at this mine. The present works were built under contract, and are entirely inadequate to the requirements. The new and larger works will occupy the same site, so that a great deal of the present plant will be utilized, just as it stands.

DAYTOWN.—Cor. *Record*, July 2: We visited the Gover mine and were lowered to the 700 foot station, where the large electric pump is in position, capable of throwing 134,000 gallons in 24 hours when driven to its full speed. We were then taken to the end of the tunnel running 500 feet south, and shown a two-foot ledge that was encountered the day before, that would mill about $20 per ton. After climbing about in the different stopes, we again boarded the skip and were lowered to the 800-foot station, but, it being near supper time and the shaft full of powder smoke, we didn't make any further explorations. A small seam of very good rock is being taken out of the bottom of the shaft, which pays about $30 per ton. The contractors are making satisfactory headway, considering the hardness of the ground. During the past year, the shaft has been newly timbered with 14 and 16 inch square spruce timbers. Everything about the mine is working in first-class order. The new self-dumping apparatus lately put in is a great improvement both as a time and labor-saving machine, and it works to perfection.

Butte.

TO TURN A RIVER.—Sacramento *Record-Union*, July 5: There will be lively times about Oroville soon, when Major McLaughlin turns the Feather River from its channel into the great flumes and tunnel that have been prepared for it. The river has now fallen so low that it is thought that this can be done within a couple of weeks.

A week ago two of the biggest shareholders in the English syndicate, J. F. Kelley and O. Harvey, dropped in upon him from London, and were escorted to the works near Oroville. They spent some days looking over the preparations that had been made for the great event and in inspecting the engineering works in which their capital had been sunk. They were pleased. The enormous flume into which the Feather River will be diverted was found to have been constructed in the most substantial manner, and could only be imperiled by a sudden freshet which would swell the river beyond its usual summer volume. But at this time of the year such an occurence is not to be feared. The Golden Gate and the Golden Feather claims extend about 8,000 feet along the stream. The dirt lodged beneath the bed of gravel, which extends down to a depth of 18 feet, is supposed to contain great quantities of gold which has been washed down from the hills in the course of ages. It is even more than a supposition, for when the works were completed last year the river was turned aside and a prospect of the claims made. The dirt that was recovered was rich in gold, and gave heart to the investors who had been induced to put their guineas into the Major's brilliant project. It was at that time too late in the season to think of beginning operations on a large scale, for the autumnal rains were coming on, and the dam was opened, permitting the Feather to flow on in its destined course. This year, however, the labor of removing the bed of gravel and getting at the pay dirt will be begun in time to give the miners at least three months' work. A great army of men will be employed, and Oroville will again assume the appearance of a prosperous mining camp.

GRAVEL.—Oroville *Register*, July 2: Mr. J. D. Campbell, Superintendent of the Catskill Blue Lead Gravel Mine at Bangor, was in Oroville yesterday and in conversation with him and W. W. Will of the Bishop Mine, Mr. Campbell said: "We have 27 men at work with us now but expect to increase this number to 100. About the first of July we will begin sinking a new shaft and it is the intention of the owners to drive this shaft down in the center of the mine so that it will drain from all directions. It will take till the last of October or the first of November before the shaft is completed, the tunnels run and all things prepared for working the mine systematically. The gravel pays regularly and is rich enough to warrant large expenditures in opening the mine properly. I was surprised to find such a large and rich channel so low in the hills. Most of the rich gravel channels are high in the mountains, but this one is richer than any with which I am acquainted and I believe that it will prove the richest and best in all California. It will pay $10 a ton right through and bed of gravel are extensive enough to last for the next fifty years. I am confident that within the next year there will be 1,000 miners employed between the Honcut and the Turner place. The gold is a light, scale or bran gold, but it is distributed evenly and the pay is regular.

Colusa.

A FURNACE.—Lower Lake *Bulletin*, July 2: Mr. Lenus has commenced the erection of a quicksilver furnace at the glades near Sulphur Creek, Colusa county. A very lively summer and fall is expected to be the experience of our enterprising neighbors just across the line.

Lake.

QUICKSILVER.—Lower Lake *Bulletin*, July 2: Harry Lightner, superintendent of the Abbott quicksilver mine, went below Saturday, to return in a few days. He is now working about 60 men, and his output of the slippers metal is a very profitable one. Fred. Formhals, Esq., of San Francisco, a quicksilver furnace builder, has been in town during the week on business connected with his profession. It is expected that he will do considerable work at the Abbott mine and other places in that vicinity during the present summer and fall.

Mono.

BONIE CONS.—*Miner*, July 1: During the past week east cross cut No. 1, 700 level, was extended 6 feet. East crosscut No. 1, 550 level, was extended 5 feet. North drift from above crosscut was extended 5 feet. The ore in face of drift is about 6 inches wide. Upraise from above drift was extended 9 feet. The ore in upraise is about the same size as in drift.

THE MONO.—During the past week west crosscut No. 3, 700 level, was extended 7 feet. North drift, 600 level, was extended 10 feet. Upraise No. 1, 600 level, was extended 26 feet.

Nevada.

GOOD CLEANUP.—Grass Valley *Telegraph*, June 28: Rodger Shackelton & Co. have been working on tribute at the New Rocky Bar, and have been doing well. The place in the mine where they are working is at a depth of about 120 feet, and the ledge is very flat. On Monday evening the tributers had a crushing at Joe Southern's mill, and the yield was $45 per load. There were 30 loads put through the mill.

San Diego.

READY RELIEF.—Cor. *San Diegan*, July 1: This property is owned by the Baily Bros., and is regarded as being the boss of the camp. Its labyrinth of tunnels, crosscuts, stopes and shafts, together with its railway tracks, give the Ready Relief the appearance of an underground town. There has not been as much ore as people suspected taken from the mine. The owners cunningly kept on developing its resources, and it now turns out that Banner has a daisy mine. The new water power works to a charm, as recent crushing proved. In fact, it is preferable to steam, as it handles the stamps with more regularity. Lately 80 tons were run through from the Hubbard mine, which, I am informed, turned out well. Also a large quantity from the Wilcox contract, the value of which I am uninformed. The finest and most valuable of the late crushings came out of the Hidden Treasure. It milled $80 to the ton. This also belongs to Baily Bros.

THE O'NEILL MINE.—Cor. *San Diegan*, July 2: Since the closing down of the Stonewall mine, a feeling of sadness prevails among the working classes. But better times are looming up. The recent crushing at the Noble mill on ore from the O'Neill mine at Deer Park was a surprise. The clean-up was much better than predicted, taking into consideration the difficulties of working the mine on account of the mammoth size of the ledge, and more particularly the scarcity of money to develop its resources. However, the difficulties are now surmounted. The O'Neill, in my opinion, will eclipse the Stonewall, for the reason that at 30 feet depth the O'Neill ore milled $10.80, with an eight-foot ledge. The O'Neill will be hard to beat.

Siskiyou.

QUARTZ AND GRAVEL.—Yreka *Journal*, June 26: Andrew G. Meyers, who in connection with Mr. Stearns, intends working the old Bellville hydraulic claim on Jackson Creek, a tributary of South Fork of Scott River, has a large stock of hydraulic pipe now on the way from below, with intention of working the claim on a very extensive scale. R. H. Campbell, of the Quartz Valley hydraulic mine, is now busy fixing up matters towards turning the property over to an English syndicate. When everything is complete and turned over to the new company, lively times may be anticipated in Quartz Valley, as a large force will be set at work in developing the mining ground of that section, by using the giants while the water holds out, and then by drifting the balance of the year when water is scarce. Some excellent quartz has been taken out at the Empire mine at Klamath River lately, and crushings made with good success, under the management of ex Supervisor Jehu Jacobs. The Golden Gate Company, comprised of business men of Yreka, keep a force steadily at work running a tunnel into the Humbug Mountain west of town, from a point on Humbug Gulch, some distance above Yreka Flats. It is expected that quartz ledges or good pay gravel may be found, also an abundance of water. Arthur and Louis Scheld have been getting some quartz out of their upper ledge on Long Gulch, called the Rattler, which is a fine two foot lode, for the purpose of testing its richness. They also crushed 4500 pounds from their lower ledge called the C. O. D. Mine. The Phil Mott claim at Klamath River, below Honolulu, paid exceedingly well in the cut just finished, and the men are now sinking down on a new cut with still better prospects.

NEVADA.

Washoe District.

CON. CAL. & VA.—*Chronicle*, July 2: There has been extracted from all parts of the mine during the week 992 870-2000 tons of ore, which was shipped to the Morgan mill, the average value of which per car samples was $28.98 per ton. The average assay value of all the ore worked at that mill during the week was $25.30 per ton per battery samples. There was worked at the Vivian mill during the week 140 tons of ore, the average assay value of which, per battery samples, was $20.81 per ton. Bullion shipped to Carson Mint, assay value, $40,884.28.

OPHIR.—1465 level—The drift running south 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground has been extended during the week 17 feet; total length 147 feet, continuing in a mixed formation of porphyry, clay and quartz which carries a very low assay value.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, at a point 40 feet east from the winze, has been advanced 21 feet; total length 122 feet; in porphyry and clay.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 23 feet; total length west from the joint shaft 2156 feet. The face is in porphyry with small seams of quartz.

UTAH.—340 level—The north drift from the west crosscut from the shaft station has been extended 47 feet; total length 348 feet. The formation continues in harder porphyry, showing some clay and water.

SIERRA NEVADA.—The joint Sierra Nevada and Union west drift, 900 level, was extended during the week 23 feet, making a total distance west of shaft of 2156 feet; face in porphyry and small seams of quartz.

GOULD & CURRY.—On the Sutro tunnel level the joint upraise with the Savage Company has been carried up a distance of 20 feet; total height 180 feet; face in porphyry and stringers of quartz. We have started a joint winze on the Savage 1500 level to meet this upraise; this winze is now down 25 feet.

BEST & BELCHER.—900 level—West crosscut No. 1 has been advanced 18 feet through hard porphyry; total length 360 feet. At a point in east crosscut No. 1, 100 feet from our main north drift, started north on a small stringer of quartz and advanced same a distance of 20 feet.

HALE & NORCROSS.—Shipped to Brunswick mill during the week 81 920-2000 tons. Ore shipments to Brunswick mill were stopped on the 26th ult., having on that date completed cleaning out all the ore remaining in the ore house. Average battery assay for the week $27.68. Shipped to U. S. Mint, Carson, yesterday 452 pounds crude bullion.

CHOLLAR.—Repairing the north drift on the 550 and 750 levels. The east crosscut in the north drift from the 630 station near the north line is in 32 feet; face in clay and porphyry.

POTOSI.—The joint Bullion winze is down 421 feet below the 1500 level; bottom in low-grade quartz. The joint northwest drift from the 1800 level of Ward shaft has a total length of 550 feet; face in porphyry. Extracted and sent to the mill in the past week 417 1900-2000 tons of ore from the 930, 1000, 1100, 1150 and 1200 levels. Milled during the week 483 tons. On hand at mill 85 1300-2000 tons; average battery assay $24.65; average car sample assays $28.06.

WARD COMBINATION SHAFT.—The joint Alpha and Exchequer south drift from the north line of Exchequer, 1800 level of Ward shaft, has a total length of 210 feet; face in porphyry. The joint Bullion and Potosi northwest drift, from the 1800 level, has a total length of 550 feet; face in porphyry.

BULLION.—The joint Potosi winze is down 420 feet below the 1500 level; bottom in low-grade quartz. The south drift, 1500 level, is out 555 feet south of north line; face in porphyry. The joint northwest drift from the 1800 level of the Ward shaft has a total length of 550 feet; face in porphyry.

ALPHA.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 210 feet; face in porphyry.

EXCHEQUER.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 310 feet; face in porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels have extracted and milled 179 tons of ore of the average value of $22.60 per ton as per battery samples. The Zadig drift from the Sutro tunnel has been extended 21 feet; total 683 feet.

CON. NEW YORK.—The winze in No. 4 crosscut, 650 level, is down on the slope 25 feet; the whole distance in fair-grade ore. The west crosscut, 850 level, is in 17 feet; face in clay and porphyry.

SILVER HILL.—The raise in the south drift, 800 feet from the Justice shaft, 490 level, is up 25 feet; top in hard porphyry.

Globe District.

SULLIVAN.—Belmont *Courier*, June 30: The Downey brothers are working the Sullivan mine, and are taking out considerable rich gold and silver ore, which they are storing away, hoping for a rise in silver. Mr. Kelly is also taking out rich gold ore from his mines in the same district.

Mammoth District.

DOING WELL. — Belmont *Courier*, June 30: Bart. Croce, in the old Mammoth district, is doing well, occasionally meeting bunches of rich ore worth from $1 to $2 per pound.

Lodi District.

SHIPMENT.—Belmont *Courier*, June 30: No work is being done at present in the Lodi Mines, but a heavy shipment of ore left the mines for Carlin a short time ago.

Union District.

ENCOURAGING.—Belmont *Courier*, June 30: In Union district the outlook is encouraging. The mines of the Indianapolis Company are being worked at present by tributers, who are doing fairly. Al. Phillips and partner, while at work in the Indianapolis mine, encountered a cross ledge, supposed to be the North Star, which gives from 8 to 12 inches of good shipping ore. P. Merten and J. McGeary are also doing well on the Emigrant mine, and have about 19 tons ready to ship. Frank Bradley has also a fine lot of ore ready to ship from his mines, principally from the Cleveland. All who can afford to do so are holding their ore back, hoping for a rise in silver. John Centras has rigged up a jigger, and is cleaning up his ore dumps. He seems well pleased with the results. His mines are principally gold-bearing and are looking well.

Tuscarora District.

NAVAJO.—*Times-Review*, July 1: North intermediate drift above the 350 level has been extended 8 feet.

BALLA ISLA.—South drift from the north line crosscut, 250 level, extended 12 feet; the face shows some improvement. No. 1 crosscut, same level, extended 4 feet and a drift started south on the vein cut last week, which is yielding some very fine ore.

NORTH BALLE ISLE.—West crosscut from No. 1 north drift, 350 level, extended 16 feet; rock very hard, but breaks well. South intermediate drift above the south 500 level extended 6 feet.

NEVADA QUEEN.—Second level—Work in south drift from No. 3 east crosscut has been suspended; face in porphyry. Stopes have been started west side of south drift and are yielding some good ore. Stopes above the level have not changed since last report. Stopes from No. 1 chute, east vein, show a little improvement in the grade of ore; continue about the same width. Hoisted for the week 54 cars first-class, assays return $287 per ton, and 471 cars sent to concentrator, battery assay $24.62 per ton. Third level—The stopes show 1½ to 2 feet of ore, average assays from which return $125 per ton. Received $35,000 from Union Mill Company on account of ore shipped.

New Arabia District.

ACTIVE.—Nevada *State Journal*, July 2: There is some activity in mines. Forty men are employed at the Arabia mines. Ore is being taken out by the owners, Stone, Scidmore & Co., and shipped to Oakland, where they have smeling furnaces.

OREGON.

THE CARPENTER.—*Bedrock Democrat*, July 2: S. F. Fore is in the city from the Carpenter hill, where he has been engaged for several months past running a tunnel to tap the ledge, the property of the Carpenter Hill Mining Company. The gentleman stated that the tunnel is now in 240 feet and that they are within 20 feet of the ledge. It is presumed that this is the mother lode and the ledge which has fed the rich placers below. We refer to the Carpenter diggings which have been successfully worked for many years and have given up thousands of dollars.

ANOTHER BAYAN MILL.—The recent visit of Mr. Geo. W. Robinson, of Detroit, Mich., a heavy stockholder in the Robinson mine, situated in the Elkhorn district, to this city resulted in the company deciding to put a mill on the property. The mine has been steadily developed for several months past, and a splendid showing is made. The mill will be a Bryan plant, the same as has been most successfully used at the Robbins-Elkhorn. The mill will be ordered at once and no time will be lost in getting everything in readiness for the reduction of the ore.

UTAH.

IN THAYNES' CANYON.—Park *Record*, June 2: The indications for a very active season up Thaynes' canyon are very flattering indeed. Rosscamp and Glenn have overtures from capital to take hold of their discovery and develop it. The Comstock will undoubtedly begin extensive operations; the Jupiter is already at work, with excellent prospects of uncovering a body of fine shipping ore; the Morning Star is being developed under a new management, while the Silver Key, Apex and Crescent complete a picture of activity that does one good to contemplate. Other parts of this great district are just as active, and there is no doubt that the season will prove the most active and largest in production in the history of the camp.

OAK AND BULLION.—The Crescent company shipped this week 499,500 pounds of concentrates. The Ontario mill shipped this week 34 bars of bullion, containing 19,292.77 fine ounces of silver. The Marsac mill shipped 6 bars of bullion this week, containing 7,093 fine ounces of silver. Following are the ore shipments from the Mackintosh sampler for the present week: Silver King concentrates, 118,710 pounds; Woodside concentrates, 42,040; Wasatch lease ore, 16,350; Silver Key lease, 24,090; Daly, 293,530; Anchor concentrates, 531,850; May Flower ore, 754,500; Silver King, 61, 260; Ontario, 334,590; total from the camp, 2,939,320 pounds.

WASHINGTON.

SWAUK MINES. — Cor. Ellensburgh *Capital*: Everything in camp is moving along prosperously, every claim is paying and every mine-owner is perfectly satisfied with his prospects. E. D. Ainsworth, superintendent of the Spokane Hydraulic Co., has purchased the Green Tree Co's. claim and is now running two giants night and day with good management and the right kind of machinery and tools to work with. This prospect will be a mint for the proprietors. Their last cleaning up for a 20 days' run was nearly 45 ounces. B. C. Pitcher, owner of the Black claim, has made two splendid clean-ups, already this season. From the second run he sold to L. R. Grimes of Ellensburgh 25 ounces of nuggets for the World's Fair collected from Kittitas county and has contracted all the coarse gold he may get for the same purpose. C. A. Deilig, on the old Pike claim has nearly finished clearing his bed rock, and last week he picked out of one crevice one $50 piece, and one $31 and several smaller pieces, besides the fine gold. Gus Nelson is doing splendidly on his Williams creek placer. He has several pocket pieces, weighing from $5 up to $31. C. E. H. Bigney has struck it rich in his Williams creek placer. He has been getting from one to four ounces in the pan and the best quality of gold ever found in the camp. It will coin $16.50 or $17 per ounce. Tweet, Johnson & York are running their arrastre day and night. J. T. Brien has discovered the extension of the Virden ledge with very flattering prospects. The Buck Horn mine, quartz, owned by Ford, Smith & Kanp, is the talk of the camp. Billy Kanp, the manager, has struck a fine body of quartz that prospects high in free gold. This ledge is about seven feet wide, with slate and porphyry walls and a great deal of the rock shows free gold. The talc clay and decomposed quartz prospects from 5 to 25 cents per pan. The owners are now negotiating for a mill and will probably have one in operation within the next 60 days.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 7, 1892.

General trade was interrupted the past week by the usual holidays attending an observance of the Fourth of July. On Tuesday business was quite fair and has since shown a decided increase in the volume of goods sent out. While some of the merchants in different branches of trade say that business is light, yet the large majority feel well satisfied, but they would unquestionably feel much better pleased if the margin of profit was not so small. Close competition with the East and other distributing cities on this coast, has reduced profits to such a low percentage that merchants have to do a very large business to make a fair rate of interest on capital invested and risks run. Manufacturers can be classed in the same line. This year iron workers have, so we are informed, executed more orders than for a half decade past. The lower prices at which they have been able to buy raw material has contributed no little in promoting better times with them. It is claimed that iron workers, as a rule, have orders in hand which will keep them busy for some time to come. If the silver bill should pass the lower House of Congress and be signed by President Harrison, the mining industry (gold, silver, copper and lead), would be revived, and with it coming actively to the front, our iron workers would have considerably more to do, for there would be a large increased call for machinery, tools, etc. The local money market is reported easy with less trouble met in receiving accommodations. The regular semiannually, quarterly and monthly disbursements are being made and by the middle of the month they will assume their largest proportions. There is more inquiry for funds with which to move the crops, but, as yet, very little has been engaged. The crops are turning out larger and better in quality than had been claimed, which will require more money than was expected to handle them properly. It begins to look as if the mining share market is being worked into a favorable position for an active bull campaign. If we should have a mining share deal, new life will be instilled into all industries, when money will find ready employment at good rates of interest.

On last Friday, the United States Senate passed Stewart's bill remonetizing silver, with an amendment attached providing for the coining of the silver hullion now held by the Mint. The bill is before the House for action, and at this writing, all information warrants the assertion that it will be passed by a good majority. It is quite generally claimed that the President will sign the bill. This opinion is founded on the belief that President Harrison seeks to carry out the wishes of the majority of the citizens of the United States, and there can be no doubt but what they wish silver remonetized. Fully one-third of all Americans are firm believers in bimetallism, while all of one-half wish it as an experiment, and if it proves good continue the law, but if it is had for the country at large, then repeal it.

From the latest official reports of the United States Bureau of Statistics of the total exports and imports of merchandise, silver and gold, for the first 12 months ending May 31st, the following tables are separately compiled, which will be found useful for reference as well as for careful study.

MERCHANDISE.

	Exports.	Imports.
1892	$1,022,961,528	$828,767,858
1891	879,997,426	846,888,913
1890	852,984,905	775,084,658
1889	738,760,514	746,842,707
1888	699,285,727	722,269,312
1887	724,132,585	685,299,322

SILVER.

	Exports.	Imports.
1892	$30,932,962	$18,837,919
1891	22,017,241	18,851,455
1890	37,090,513	21,574,419
1889	35,943,068	18,196,221
1888	27,324,260	15,470,177
1887	26,403,001	17,453,900

GOLD.

	Exports.	Imports:
1892	$48,882,061	$49,477,446
1891	74,271,910	18,335,491
1890	31,673,999	13,216,177
1889	44,975,687	9,919,363
1888	15,842,274	44,146,400
1887	17,461,014	42,668,039

The above tables show that while our exports of merchandise and silver have been increasing at an enormous rate, since 1888, both the import and export of gold has increased. An analysis of the tables shows that while for the year ending May 31, 1888, we imported $13,113,225 more merchandise than we exported of merchandise and silver, yet in the same time we imported $28,304,126 more gold than we exported, making a total of $41,417,351 more of merchandise, silver and gold imported than were exported. These facts show that there was such a flow of foreign capital to this country that it more than neutralized the adverse balance of trade against us. That was the year when an enormous amount of American railroad bonds were floated in Europe—a much larger amount than was ever before or has since been placed abroad. The aggregate capitalization in capital stock, funded and floating debts of the railroads in the United States was increased in the calendar year 1888 nearly $700,000,000—from a total of $8,673,187,000 in 1887 to $9,369,290,000 at the end of 1888. But from that time the tide of foreign capital began to ebb. In 1889 the increase of the capitalization of the railroads was only $311,642,000 to an aggregate of $9,680,932,000 at the end of 1889. Since then the return movement of foreign capital has also been increasing so that exchange has been running more and more against us. In the twelve months ending with May 31, 1888, we received $41,417,351 more of merchandise, gold and silver than we exported, yet we did, in the corresponding time ending May 31, 1892, export $205,693,328 more than we received. The letter shows unmistakably that we have been paying back part of the borrowed foreign capital, as well as the interest on that not paid, and this "paying back" has been made by the sale of American securities in the New York market for European account.

The above shows that the flow of gold from the United States was not so much from a fear of silver legislation as it was to pay for American securities bought for profitable investment.

SILVER.—Immediately following the passing by the United States Senate of the Stewart silver bill, prices abroad and at home advanced, only to fall back on yesterday. What the decline was based on it is hard to say, for all present advices indicate that the House of Representatives will pass the bill as it came from the Senate, and that it will be approved by the President is accepted as a foregone conclusion. The amendment to the bill requiring that the hullion now in the mints shall be coined, is good, for the piling up of hullion has been a menace to the market by causing European nations to look with distrust on the movement in this country to purchase the output of American mines. With this removed, more confidence will be felt, and the hoarding of silver not be attended with fears that the markets might break at times by the United States unloading hullion. European advices indicate that Italy and Austria will soon have to commence buying silver. The demand from India is not as large as was looked for.

MEXICAN DOLLARS—The market is barely steady at 70½c@71c.

BORAX—Exports the past week aggregate 1520 to New York. The market is fairly firm.

QUICKSILVER—Receipts aggregate 346 flasks and the exports by sea 140 flasks to Mexico. The market remains steady at quotations.

LIME—Receipts the past week aggregate 1778 hbls. The demand both local and for export, is fair for the season. The range of value is $1 40 to $1 50 per barrel.

ANTIMONY—The market is fairly steady at current quotations. The New York market is reported firm but quiet.

TIN.—The market is easy. The demand is slower for pig. Eastern advices report that the market has every indication of sagging to still lower prices, probably to again trap short sellers. There is a feeling of caution among outsiders.

LEAD.—The market is strong and in sellers' favor. New York advices are quite bullish owing to stronger holding and higher figures in the St. Louis market.

COPPER. — The market has been gradually sinking. New York mail advices are not of an encouraging character for holders. Under date of June 17, at Liverpool, James Lewis & Son says: "The nine principal mining companies in the United States have agreed among themselves that their production shall, for the year commencing July 1 next, be 100,893 tons, against 90,625 tons in 1891. The production not included in this agreement amounted to 36,160 tons in 1891, when the total was 226,785 tons. European mining companies, producing about one-half of the total production, have agreed to place a limit on their output in some cases reducing by 5 per cent that of the year 1891, while in others they have been allowed an increase amounting in one important instance to 10 per cent. Chilian producers are not included in the agreement, their production last year having suffered considerably from the war. We may, therefore, look for some increase from this source.

PIG IRON—Imports the past week aggregate 420 tons from New York. The market is fairly firm at quotations. Eastern mail advices are conflicting. A further reduction was made in prices the past week. *Iron Age* says: "The large Western Agricultural Implement makers are arranging for a 12 months' supply of raw materials. They have been trying to buy foundry iron for a year's delivery at present prices, but have found some Southern makers unwilling to commit themselves beyond this year"

There was imported the past week 701 tons of steel Bloom from Cardiff.

COAL—Imports the past week aggregate as follows: Sydney, 3865 tons; Nanaimo, 2474. Newcastle, N. S. W., 11,694; Seattle, 5875; Departure Bay, 4377; New York, 203. Total, 28,488 tons. The market does not show any material change in quotations. The consumption of straw is enlarging, but the supply on spot and to arrive is ample for all nearby wants.

COKE—Imports the past week aggregate 2142 tons from Cardiff. The market is steady at current quotations.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb	— @ 15	English, lb	— @ 18
BORAX.		Canton tool	— — 8½
Refined, in car lots	— @ 7½	Sl'k Diam'd tool	— — 8½
Powdered, do	— @ 7½	Pick & Hammer	— @ 9
Concentrated, do	— @ 6½	Machinery	— @ 4½
All grades jobbing at advance.		Do Calk	— @ 4½
COPPER.		TINPLATE.	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 00
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 6 00
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 6 00
Fire Box Sheets	22 @ 24	Dn, do, 20x28	—@12 00
IRON.		PIG TIN.	
Bar, base	— @ 3	Spot ₱ lb	—@ 23
Nurway, base	— @ 4½	COAL.	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton ₱ ton	22 00@—	Wellington	$8 00
Glengarnock	23 00@—	Gretta	6 75
Am. Soft, No. 1	24 00@—	Nanaimo	7 00
Oregon Pig	—@—	Gilman	6 00
Puget Sound	—@—	Seattle	6 50
Clay Lane White	24 00@—	Coos Bay	5 50
Langloan	22 00@—	Cannel	8 50
Thornoliffe	23 00@—	Egg, hard	11 50
Gartsherrie	22 00@—	Cumberland, in sacks	14 00
Barrow	22 00@—	Do, hulk	13 00
Carrofleet	22 00@—	Wallsend	7 00
CHROME IRON ORE.		Scotch Splint	7 00
Per ton	10 00 @—	Brymbo	6 75
		West Hartley	7 50
LEAD.		TO LOAD—PER TON.	
Pig	— @ 4½	Australian	5 75@—
Bar	— @ 5½	Liverpool Steam	6 00@—
Sheet	— @ 7	Scotch Splint	6 00@—
Pipe	— @ 6½	Cardiff	6 25@—
SHOT.		Lehigh Lump	12 00@—
(Discount 10% on 500 bags.)		Cumberland	9 00@—
Drop, ₱ bag	1 80 @ —	Egg, hard	10 00@—
Buck, ₱ bag	2 00 @ —	West Hartley	6 50@—
Chilled, do	2 20 @ —	COKE.	
QUICKSILVER.		English, to load	$8 00@ 9 00
Home trade, pr. flask	43 50 @44 00	Do, spot, in bulk	10 00@—
For export	38 @	Do, in sacks	12 00@—
		Cumberland	9 00@—

EUREKA DISTRICT, Nevada, has produced about $70,000,000 in silver, gold and lead, and there are still many mines in that region awaiting development.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED, DELINQ'T AND SALE.	SECRETARY.
Alta S M Co, Nevada	42	15c	June 18, July 26, Aug 16	L Osborn, 309 Montgomery
Belcher S M Co, Nevada	44	25c	May 17, June 21, July 12	C L Perkins, 34 Pine
Bodie Cons M Co, California	14	25	June 20, July 22, Aug 22	H D Walker, 3-9 Montgomery
Bullion M Co, Nevada	38	25c	May 24, June 28, July 19	R. R. Grayson, 331 Pine
Butte King M Co, Nevada	8	5c	June 4, July 11, Aug 2	W C Lewis, 723 Market
Challenge Con M Co, Nevada	11	25	May 16, June 20, July 12	C L McCoy, 331 Pine
Chollar M Co, Nevada	33	50c	May 28, June 7, July 27	C E Elliott, 309 Montgomery
Commonwealth Cons M Co, Nevada	8	10c	June 15, July 21, Aug 18	R R Grayson, 331 Pine
Con St, Gothard M Co, California	5	5c	June 9, July 14, Aug 4	T Wetzel, 320 Sansome
Cons New York M Co, Nevada	8	10c	June 28, Aug 2, Aug 23	C E Elliott, 309 Montgomery
Evening Star M Co, California	4	2½c	June 7, July 12, July 29	J J Scoville, 320 Sansome
Fall River Con M Co, California	8	3c	May 27, July 2, July 27	A Lorshach, 409 Clay
Golden Prize Con M Co, Nevada	5	25c	Feb 29, June 22, July 13	O Bennett, 327 Market
Gould & Curry M Co, Nevada	69	52c	June 7, July 12, Aug 4	A K Dunrow, 309 Montgomery
Mexican G & S M Co, Nevada	35	25c	May 16, June 21, July 12	C E Elliott, 309 Montgomery
Mexican Phosphate and Sulphur Cn	1	10c	June 8, July 18, Aug 8	A Halsey, 328 Montgomery
Ophir M Co, Nevada	18	50c	June 3, July 7, July 27	E B Holmes, 3-9 Montgomery
Overman M Co, Nevada	—	30c	May 19, June 22, July 11	G D Edwards, 414 California
Pearl-se M Co, Arizona	18	5c	July 6, Aug 11, Sept 7	A Waterman, 309 Montgomery
Sierra Nevada M Co, Nevada	102	25c	June 10, July 13, Aug 2	E L Parker, 3-9 Montgomery
Siskiyou Cons Quicksilver Co, California	4	1½c	May 14, June 17, July 8	E. E. Stone, 3-6 Pine
Summit M Co, California	12	5c	June 27, July 19	M E Welles, 309 Montgomery
Terikoff G M & M Co, California	8	1c	May 31, July 6, July 29	W J Gur ett, 308 Pine
Utah Con M Co, Nevada	15	25c	June 7, July 11, July 29	A H Fish, 309 Montgomery
Yellow Jacket M Co, Nevada	51	25c	May 9, June 14, July 18	W H Blanvelt, Gold Hill

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Best & Belcher M Co, Nevada	Annual	L Osborn, 309 Montgomery	July 11
Live Oak Drift Gravel M Co, California	Annual	E Cheminant, 313 Montgomery	July 30
Union Cons M Co Nevada	Annual	A W Barrows, 303 California	July 18
Yellow Jacket M Co, Nevada	Annual	W H Blanvelt, Gold Hill	July 18

LATEST DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	June 10
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	July 11
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

Mining Share Market.

SAN FRANCISCO, July 7, 1892.

A three-day holiday appears to have enthused the manipulators, or else they studied with good effect the pyrotechnic displays on the Fourth wherein sky rockets predominated, for on Tuesday afternoon and Wednesday morning the Belcher shares shot up like a sky rocket only to fall back equally as fast. The upmove instilled new life along the line of which the better informed of outside operators took advantage and sold believing that there is no positive signs, as yet, that the manipulators intend making a deal. Published reports of the work being done in the mines, point to time killing, for what purpose each operator must be the judge. There is still being done a large amount of very important secret work, but the share market and other conditions do not appear to warrant the making of it public. When the time does arrive all the secret strikes and developments which have been done will be done over again and the strike be made to appear as if they are new and made accidentally. While the work on the 400-level in Belcher warrants better prices than now rule for the shares, yet it does not justify outside shareholders in looking for much higher prices; but when the management gets ready to show up one or more of the lower levels where good to high grade ore is known to exist, then we can look for quite an advance in the shares. Before that time arrives the reported controller (D. O. Mills) of that and other Gold Hill mines may find it necessary to have his dummy directors of several mines levying more assessments.

It is said by persons who should know that inside secrets of the past management of several mines will be made public in due course of time, and when they are public property persons who now pose in society for all that wealth brings will be electrified by the exposures and the public made to see in its true light things which are worse than was uncovered in the Hale & Norcross suit. It is to be hoped that with these exposures, Comstock mine managers will purge themselves so far as to be at least half way honest.

Even with this concession to honesty, a big share market can be promoted. The mines were probably never before in such favorable working condition as they are at present.

Shares in the mines of outside mining districts continue flat, stale and unprofitable. It would seem as if the manipulators have had ample time to concentrate the shares so as to make a deal. Several of the mines in each district can be made to pay dividends.

Some mining share operators are surprised at an upmove in the shares in the Gold Hill mines, for heretofore when D. O. Mills visited this Coast the market went down.

Consolidated Virginia's monthly statement of hullion productions shows that the ore is running largely to gold. The question naturally presents itself: Does not the ore come from the West or Red Lode?

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Dr.	Cr.		Dr.	Cr.
ARIZONA MINES.			East Sierra Nev	—	24
Crocker	—	$2,021	Gould & Curry	$5,623	—
Peer	—	648	Hale & Norcross	9	—
Peerless	—	$23	Julia	—	6,480
Silver King	$1,889	—	Justice	—	1,406
Welson	—	—	Lady Washington	—	6,665
BODIE MINES.			Mexican	—	$2,067
Bodie	—	$76	Occ dental	—	5,866
Bulwer	—	9,434	Ophir	19 226	—
Mono	—	8,292	Overman	—	176
Standard	—	45,242	Potosi	23,463	—
Summit	1,747	—	Savage	1,954	—
Syndicate	—	1,589	Seg. Belcher	—	8,268
COMSTOCK MINES.			Scorpion	—	175
Alpha	—	10,878	Sierra Nevada	—	$4,043
Alta	—	$9,514	Silver Hill	—	4,224
Andes	—	15,423	Union	—	2,842
Belcher	—	$10,346	Utah	$3,117	—
Benton	—	—	TUSCARORA MINES.		
Best & Belcher	—	7,867	Belle Isle	13,932	—
Bullion	4,655	—	Coptis	—	13,725
Caledonia	—	6,606	Commonwealth	28,981	—
Challenge	—	2,268	Del Monte	21,624	—
Chollar	15,049	—	Diana	—	—
Confidence	4,344	—	Grand Prize	5,792	—
Con. Cal. & Va	1,642	1,157	Independence	204	—
Con. Imperial	2,178	—	Navajo	17,364	—
Con. New York	—	$2,083	Nevada Queen	—	13,389
Crown Point	—	15,672	North Belle Isle	14,237	—
Exchequer	—	5,620	N. Commonwealth	—	3,351

*Collecting an assessment.

NOTE.—Navajo has $12,800 due on pumping account. Con. Cal. & Va. has $51,301.24 in unsold hullion. Hale & Norcross has all thh month's hullion to come in.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 15.		WEEK ENDING June 22.		WEEK ENDING June 29.		WEEK ENDING July 6.	
Alpha	.15	.25	.20	....	.15	.20	.20	.30
Alta	.30	.40	.15	.30	.15	.20	.15	.20
Andes	.40	.45	.35	.40	.30	.35	.40	.45
Belcher	.50	.97	.60	*1.20	1.05	1.20	1.25	1.95
Belle Isle	....	....	....	....	.05	....	.05	....
Best & Belcher	1.80	2.15	1.75	1.95	1.50	1.65	1.65	1.95
Bullion	.40	.50	.30	.40	.30	*.55	.50	.65
Bodie Con	.15	.25	.15	.20	.10	.15	.15	....
Bulwer	.50	....	.40	.45	....	....	....	....
Commmonwealth	....	.25	....	....	.05	....	....	....
Con. Va. & Cal	3.60	4.05	3.60	3.85	3.20	3.55	3.35	3.60
Challenge	.15	.30	.40	*.45	.40	....	.50	.65
Chollar	.35	.45	.25	.35	.20	*.70	.75	.85
Confidence	1.25	....	....	....	1.25	....	....	....
Con. Imperial	.15	....	....	....	.05	....	.05	....
Caledonia	.20	.25	.20	....	.15	.25	.20	.30
Crown Point	.75	1.00	.75	.90	.70	.85	.80	1.25
Crocker	....	....	....	....	....	....	....	....
Del Monte	.10	.15	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.15	....	.10	.15	.10	....	.15	....
Grand Prize	.10	....	.10	....	....	....	....	....
Gould & Curry	.90	1.10	.75	.85	.55	.70	.70	.95
Hale & Norcross	1.25	1.45	1.10	1.45	1.25	1.40	1.35	1.50
Julia	.15	....	....	....	....	....	.05	....
Justice	....	....	.15	....	....	....	.15	.20
Kentuck	.05	.10	.10	....	.10	....	.15	....
Lady Wash	....	....	....	....	....	....	....	....
Mono	.40	.45	.30	.35	....	....	.35	....
Mexican	1.25	1.45	1.40	1.55	1.25	1.40	1 40	1.70
Navajo	....	....	.05	....	.05	....	....	....
North Belle Isle	.15	....	....	....	.10	.15	....	....
New Queen	.45	.90	.45	.50	.45	.80	.45	.50
Occidental	.40	.45	.35	....	.30	.35	.30	.40
Ophir	2.15	2.45	1.80	2.25	1.35	1.80	1.50	*2.60
Overman	.40	.50	.30	*.60	.50	.60	.60	.75
Potosi	.50	.65	.40	.50	.50	.55	.55	.70
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	.05	....	.10	....	....	....
Savage	1.85	2.10	1.40	1.65	1.35	1.45	1.40	1.60
S. B. & M	.20	.35	.20	.30	.25	....	.25	.35
Sierra Nevada	.80	1.15	.80	.85	.60	.80	.75	1.00
Silver Hill	.05	....	.05	....	.05	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.85	1.10	.80	1.00	.70	.90	.85	1.25
Utah	.10	.15	.10	....	.05	....	.05	.10
Yellow Jacket	*.75	.90	.75	.90	.75	.85	.85	1.00

*Assessment added.

Eastern Metal Markets.

NEW YORK, July 6.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	40½	87⅝	11 50	4 17½	21 10
Friday	40 3-18	87⅝	11 50	4 17½	21 10
Saturday	40½	88	....	....	....
Monday	....	....	....	....	....
Tuesday	40½	87⅝	11 40	4 17½	21 10
Wednesday	39 13-16	86⅞	11 40	4 22½	21 00

Quicksilver is steady at the last quoted advance. Lead is advancing under an improved demand and a strong holding. Tin is lower and easy. Copper continues in buyer's favor. Pig iron continues to recede in price.

THE new building for mechanical and electrical engineering at the University of California is to cost $65,000.

The Explorers' and Assayers Companion.

A Third Edition of selected portions of the "Explorers', Miners', and Metallurgists' Companion."

A practical exposition of the various departments of Geology, Exploration, Mining, Engineering, Assaying, and Metallurgy.

Price, $6.00 post-paid. Sold by DEWEY PUBLISHING CO., Publishers, 220 Market St., San Francisco.

BY J. S. PHILLIPS, M. E.

The work is divided into four parts—Rocks, Veins, Testing and Assaying. The geological chapters are intended to give miners a practical idea of the various formations. The chapters on mineral veins are derived from long observation, and the section on exploration has been carefully considered. All that relates to discrimination and assay of minerals has been kept as free from ormulæ as possible. The work is written for practical men, and all the explanations and descriptions are clear and to the point. It is so prepared that it is useful to uneducated men as well as scientists.

Postmasters are requested to be sure and notify us when this paper is not taken from their office. If not stopped promptly (through oversight or other mishaps) do us the favor to write again.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JUNE 28, 1892.

477,982.—SPRING GUN—J. W. Atkinson, Milpitas, Cal.

477,735. — MAKING WHITE PIGMENTS — John Blair, Spokane, Wash.

478,047.—CUT-OFF VALVE GEAR—H. T. Clarke, Portland, Or.

477,739.—DOOR HANGER—A. G. Dahmer, Alameda, Cal.

477,934.—ORE CONCENTRATOR—H. F. Hicks, Ashland, Or.

477,959.—TREE PROP—T. J. Hubbell, San Bernardino. Cal.

477,946.—GUN—Livingston & Starrett, S. F.

477,952. — GRAPE PICKER — Moore & Jory, Stockton, Cal.

477,956.—LATH BOLTER—J H. Peterson, Portland, Or.

477,912.—REVERSIBLE PLOW.—A. Pirch, Los Angeles, Cal.

478,024 —PIPE-LAYING DEVICE—E. H. Rose, Colton, Cal.

477,705.—BICYCLE STAND—M. J. Russell, Los Angeles, Cal.

477,963. — LOCKING MAIL POUCHES — A. J. Shaw, Spokane, Wash.

478,029.—ELEVATOR HATCH—C. P. Stanford, S. F.

477,718.—ELEVATED TRAMWAY—W. P. Walling, Santa Monica Cal.

The following brief list by telegraph, for July 5, will appear more complete on receipt of mail advices.

San Francisco—Theodore F. Burkhard, whipsocket and reinholder; Silas Harris, railway chair; Samuel Rodgers, explosive compound; Charles E Blake, Sr., dental forceps; Olaf Eastman, water filter. Sacramento—John F. Linthgum, machine for wrapping papers. Vallejo — Lewis H. Fowler, fire ladder. Berkeley—James Hewitt, tripod. San Bernardino—Lyman N. Bedford, time lock.

Oregon—George L. Wilcox; H F. Hallenbeek and T. Wandell, all of Albany, cloth-measuring machine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CAN-HEADING MACHINE.—Milton A. Wheatou, S. F. No. 477,584. Dated June 21, 1892. This machine is new in its general plan and in its details of construction and operation. It would be difficult to describe in detail without the aid of elaborate engravings. There are certain chutes which are kept filled with can-heads and can-bodies. These stand in columns resting upon one another, except the lower ones, which will rest upon such part of the jaws of the machine as happen to be under them. The machine is set in motion, and, as it revolves, the jaws will pass under the chutes, and each set of jaws will receive the lowest can-body and also the lowest can-head that is in each one of the can-head chutes. When the can comes out of the machine, the head is fixed to it.

CONCRETE MIXER.—George F. and Harry N. Gray, S. F. No. 477,361. Dated June 21, 1892. This apparatus for mixing the ingredients of concrete consists in a vertical box or casing, into the upper end of which the ingredients are deposited and from the lower end of which the mixed material is received, said box or casing containing a vertical series of separated and oppositely inclined shelves or platforms, whereby material is carried by gravity through a tortuous course, falling from one shelf or platform to the other, whereby it is thoroughly mixed. It also consists, in connection with said box or casing, of a suitably arranged water distributor adapted to direct water upon the material as it falls from shelf to shelf. The whole thing is adapted to be mounted upon and lie between the sides of a mold for a retaining-wall, and can be moved back and forth therein to deposit the mixed material in said mold throughout its length. The object is to provide an easily movable mixer adapted to operate in such position as to deposit the mixed material, during the course of its movement, throughout the length of the work to be performed—such, for example, as the construction of a retaining-wall.

SPRING-GUN.—James W. Atkinson, Milpitas, Santa Clara Co., No. 477,982, Dated June 28, 1892. The invention relates to that class of guns for killing burrowing animals, such as gophers, in which a forwardly-projecting tripod is employed to actuate the firing mechanism. The objects of the invention are to provide for convenience in loading and absolute safety in handling and setting the firing mechanism and handling the gun while adjusting it in position.

GUN.—Andrew W. Livingston and Stephen E. Starrett, S. F. No. 477,946 Dated June 28, 1892. The object of this invention is to construct a gun in which the inertia of the projectile is first overcome by a moderate charge of an explosive or of some propelling gas or vapor under pressure and after the inertia has been thus overcome to apply the force of the final propelling charge to give the projectile its final impulse.

ELEVATOR HATCH.—Charles P. Stanford, S. F. No. 478,029, Dated June 28, 1892. The invention relates to certain improvements in automatically-operated elevator-hatches or doors such as are employed to close the openings in the floors of buildings through which elevator cages pass or which may be used at any desired intervals to cut off and close the elevator-well. The present invention is an improvement on a patent issued to the same inventor, June 8, 1890.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the seventh (7th) day of June, 1892, an assessment (No. 69) of Twenty-five (25) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twelfth (12th) day of July, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 4th day of August, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Trustees

ALFRED K. DURBROW, Secretary.

Office—Room No 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

THE BUTTE KING MINING COMPANY. LOCATION of principal place of business, San Francisco, Cal. Location of works, Butte County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of June, 1892, an assessment (No. 4) of five cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary, at the office of the Company, 723 Market St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 11th day of July, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 2d day of August, 1892, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors,

W. O. LEWIS, Secretary.

Office, 723 Market St., San Francisco, Cal.

TERIKOFF G. M. AND M. COMPANY. LOCATION of principal place of business, San Francisco, Cal. Location of works, Amador County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of May, 1892, an assessment (No. 8) of one cent per share was levied upon the Capital Stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary, at the office of the Company, 308 Pine St., San Francisco, Cal.

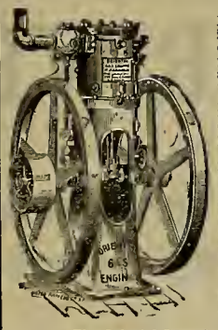
Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1892, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Friday, the 29th day of July, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

W. J. GURNETT, Secretary.

Office, 308 Pine St., San Francisco, Cal.

THE ORIENTAL GAS ENGINE



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M. A. GRAHAM,

Inventor and Manufacturer,

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DIVIDEND NOTICE.

The German Savings and Loan Society,

526 California Street.

FOR THE HALF YEAR ENDING JUNE 30, 1892, A dividend has been declared at the rate of five and one-tenth (5 1-10) per cent. per annum on Term Deposits, and four and one-quarter (4¼) per cent. per annum on Ordinary Deposits, payable on and after FRIDAY, July 1, 1892. GEO. TOURNY, Secretary.

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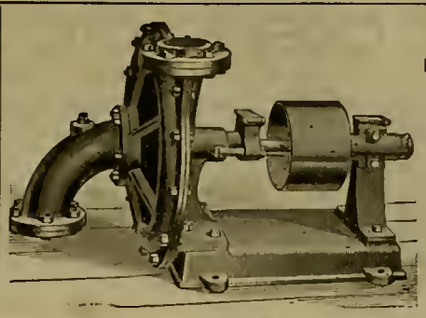

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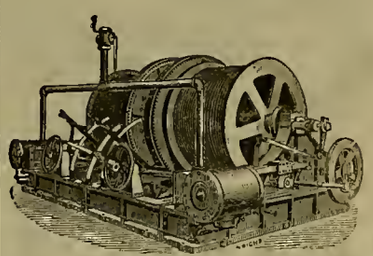

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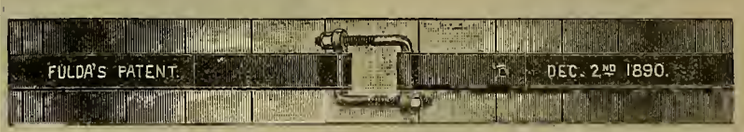

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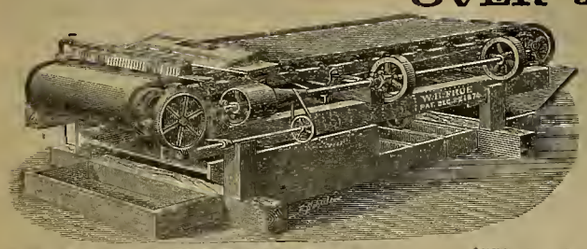

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Office of General Manager,
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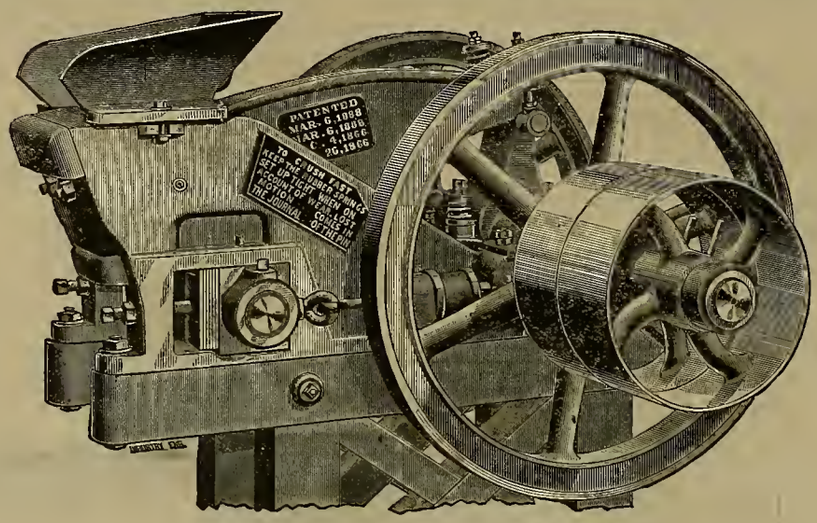

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VOL LXV.—Number 3.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, JULY 16, 1892.

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The "Comet" Rock-Crushers.

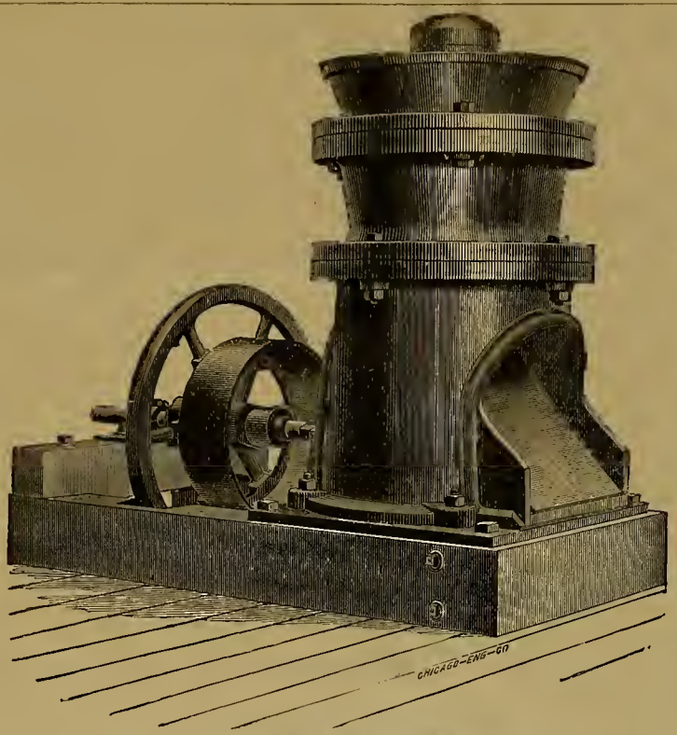
Many forms of rock and ore crushers or breakers have been devised, and among them are several which will perform their requirements of work, are substantial in construction, compact in design and of large capacities in practical service.

In this connection we take occasion to present two cuts of the "Comet" rock crusher, one showing its form and design, the other illustrating, in a sectional view. its plan of placing in position and its method of operation. Referring to the sectional view it will be noted that A designates the crusher proper, firmly placed upon a substantial frame of wood, from which the crushed material passes over the descending inclination of a chute into the revolving screen C, which is provided with perforated screens or wire cloth having such sizes of perforations or meshes as may be required for the discharge of the material in fragments of suitable dimensions, which fall through the hoppers or spouts D and E into the cars G G below. Such material as may not have been broken sufficiently small to pass through the perforations of the revolving screen descends through the spout F into the elevator B, whence it is conveyed by a series of buckets to the crusher for further disintegration.

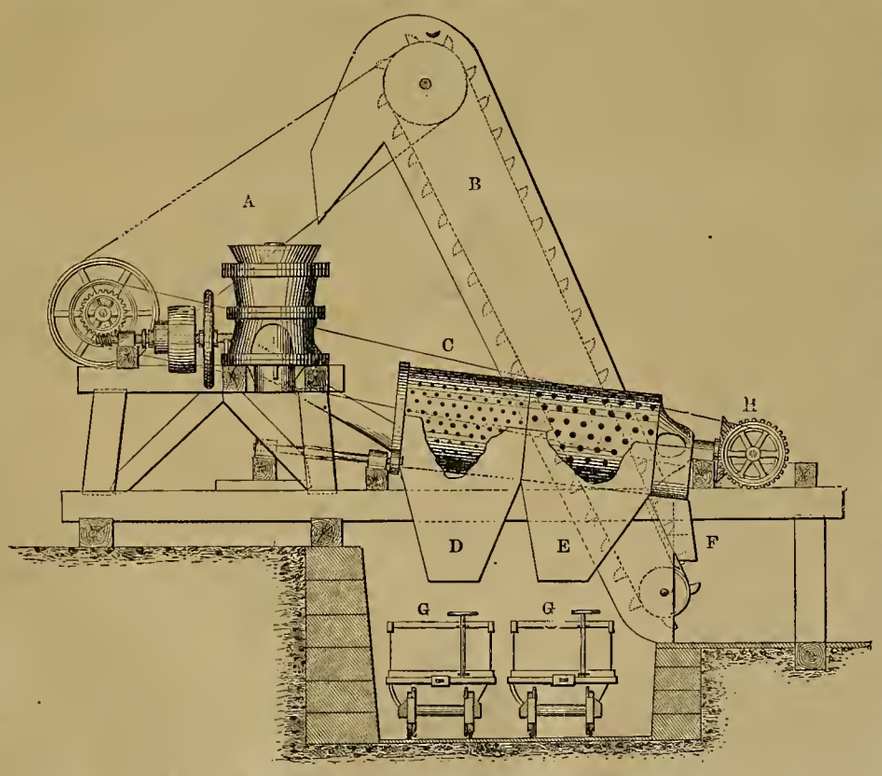
These crushers have been specially designed for and are particularly adapted to crushing railway ballast and street macadam, but are constructed of sufficient strength to crush also with ease ores, granite, phosphate, corundum, concrete, etc., and have been subjected to the severest possible tests, in prearranged trials for that purpose, and have successfully withstood the ordeal.

The exceedingly large capacities of these crushers is attributable to their great receiving capacities and easy motion, without perceptible concussion or vibration. In instance of this, a car of rock can be dumped bodily into the hopper of one without producing any change in the operation of crushing. In testing a No. C crusher, having an opening of 8½ by 17 inches, working upon an exceedingly tough character of rock, it was found that its feeding capacity exceeded the combined labor of three men to feed it, "fire flying all the while," as they said, putting through eight yards of this tough rock in 20 minutes, or say an average of 16 yards per hour, including all delays, stoppages, etc. In a test of a crusher, No. E, having an opening of 12 by 24 inches, its consumption of rock was one ton per minute during the period of the trial.

In the absence of a cut giving a sectional view of the interior arrangement of the several parts of the crushing devices adopted in this form of crusher, we can only outline generally the principles which are involved in the operation of these machines. The axis of the upright spindle is not coincident with the main axis of the machine or bevel wheel, but intersects it in a journal at the top, while the lower end is from one-quarter to three-quarters of an inch out of center. This arrangement produces a gyrating motion at the bottom of the spindle, the top of the journal being practically stationary, except in the slight motion due to the angularity, which is very small, and is compensated for by an oscillating box. The spindle, with its fixed crusher-head, is not fastened into the bevel wheel, but is free to revolve in it.



THE COMET ROCK-CRUSHER.



ROCK CRUSHING PLANT WITH ELEVATOR AND SCREEN.

Crushing is caused by the moving of the crusher-head to and from levers, the same as in a "Blake" or other similar style of crusher with reciprocating jaw motion, and, as the entire space around the head is filled with rock, the crusher is doing duty at every point in revolution of the pulleys and gears. By reason of this, there can be neither shock nor jar, and further, there is no grinding action, as the head does not turn while crushing, although free to do so when not crushing. The crushed rock drops into the inclined chute and thence immediately slides out.

The Joshua Hendy Machine Works, of No. 51 Fremont street, this city, have been constituted the agents for the sale of these "Comet" crushers in the Pacific States, and their representatives can furnish fuller and more explicit explanations of the interior workings of these crushers than are outlined above.

It is deeemed pertinent to state that one of these crushers, a No. C, having an opening of 8½ by 17 inches, has been placed in operation by Mr. W. J. Holmes in his quarry situated on the corner of Clipper and Douglas streets, between Twenty-fifth and Twenty-sixth streets, near the terminus of the Castro street cable railway line, where it can be seen and examined in its thoroughly successful workings and output of macadam for street use and concrete material for foundation, paving and other purposes.

There will also be found at this quarry, under the management of Mr. Holmes, an admirably arranged automatic and economic plant for an almost unlimited production of crushed rock for the many uses to which such material may be necessary.

THE City Council has granted two franchises to build and operate electric railways in the city of Phœnix, A. T. One was granted to men representing San Francisco capital and the other to Lem Harris of Denver. They are compelled to begin construction in six months.

THE Albany Gold Mining Co. has filed articles of incorporation. Its capital stock is $1,000,000. The directors are: F. E. Luty, Sylvester Gardner, T. E. Jewell, Jno. Henderson and F. C. Mosebach.

IT IS possible that another warship will be built on the Pacific coast. The $4,000,000 battle-ship provided for by the Naval Appropriation bill will likely be built by Scott, as it is understood that the Cramps will be in better condition to take the contract for the other vessel—the armored cruiser. The new battle-ship is to be the peer of any in the world—a triple-screw ship, maintaining a higher rate of speed than now attained by vessels of that class.

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CHAS. G. YALE, } .....EDITORS
ALFRED HOLMAN.....MANAGER

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO, SATURDAY, JULY 16, 1892.

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The Troubles at Cœur d'Alene.

There has been more or less difficulty at Cœur d'Alene, Idaho, for a long time between the mine-owners and the Miners' Union of Cœur d'Alene. This organization comprises the unions of Wardner, Gem, Burke and Mullan districts. Over a year ago, when the mines were working, everybody got $3.50 per day. The mines were finally shut down owing to excessive rates charged by the railroad for taking the ore to the smelter. The mines were to start in April, and then the wages of shovelers, carmen and other surface laborers were reduced to $3 and their time of work increased. The men refused to work on this basis and miners were brought from California and elsewhere to fill their places in some of the mines.

On Monday of this week the strained situation culminated in a fight at the Gem and Frisco mines, at the town of Gem, between union and nonunion miners. Five men were killed and 16 wounded. The Frisco mill was blown up during the fight and is a complete wreck.

The Governor was called upon, and ordered the militia to prepare to go to the scene of the trouble. The miners have destroyed bridges and tracks to prevent the approach of the militia, and the Governor has declared martial law. A number of nonunion men left the mines and went to Old Mission to wait for the boat. Here they were attacked by union miners and 12 of them shot, in the most cowardly manner, while fleeing for safety. The union men have turned over the Bunker Hill and Sullivan property to the sheriff. The whole occurrence is very serious indeed, and the trouble is not yet over.

It will be found if capitalists, who open and work mines, are expected to pay ordinary surface labor the prices they have to pay for skilled underground miners, especially when that rate is $3.50 per day, that there will be fewer mines opened in the future. Very few mines can stand paying such prices for unskilled work. It will further be learned, if people who invest in mining property are to have that property placed at the mercy of their employes in case of disagreement, they will seek other form of investment. Again, if miners' unions find it necessary to carry their point by force of arms; use dynamite to blow up mills and bridges; and shoot down nonunion miners who are unarmed, then miners' unions will not last as long as they might otherwise. Neither mine owners nor the public will stand any such behavior. It is all very well to stand together to keep up wages, but there is reason in all things; and when acts of lawlessness are committed, the unions can no longer expect the public to hold them in any kind of estimation. It is a bad cause which has to resort to such expedients.

The Hydraulic Mining Bill.

Unless there is another "suspension day," and unless on that day the hydraulic mining bill is in better luck than on Thursday of last week, it may be considered as laid on the shelf for this session of Congress. There is still a hope, however, for there is no doubt but two-thirds of those in their seats, the other day, when the test came, favored the bill; but a Texan Congressman objected and made it impossible to put the measure through. The California delegation, without exception, had labored with every Congressman within reach to put down any opposition that might creep up, and on every side assurances of friendship were offered.

When the bill had been read, however, and before any remarks upon it could be made, Bailey of Texas arose and put in his accustomed objection. He demanded a second, which meant that a majority of the whole House must vote in favor of the question in an indirect way before a direct vote upon the bill could be taken. Not enough votes could be mustered to accomplish this, and upon the suggestion of Dockery of Missouri the speaker announced that the bill would go over to the next suspension day as unfinished business. The vote on ordering a second was 132 to 3.

Everything depends upon the humor of the House. If there is a disposition to adjourn sine die as quickly as possible, there will probably be no more suspension days, and in that event the only way to bring the bill before the House would be by special rule, and it is very doubtful if one can be secured. Bailey was not the only objector. While the bill was being read, he held a consultation with Kilgore and Watson, a Farmers' Alliance man from Georgia, and it was quickly seen that they meant mischief. They were soon surrounded by friends of the bill, who urged them not to offer any objection; but prayers and threats alike were without avail. Watson relented, but the two Texans announced their determination to defeat the bill, if possible, and they did so for the present at least. They offered no excuses for their conduct, unless Mr. Bailey's remark that he doubted the constitutionality of the measure can be taken as such.

Bailey has done nothing but object during the whole session, as the records show, being an abridged edition of Holman. It is said that when he entered Congress he asked Culberson what he should do to make himself famous. "Get a fad," said the great Texas lawyer, "and stick to it." He made objection to everything and anything under all circumstances. His fad worked, and he has stuck to it. Had he not done so, the House might have passed the mining bill without opposition.

Mr. Caminetti said that he had repeatedly offered to explain the bill to Mr. Bailey and others, but that they said it was quite unnecessary. "It is your bill and we will help you," some had assured him. Republicans voted for the bill with the full knowledge that the fact of its passage would be used as campaign ammunition by Caminetti and the Democrats this fall.

Mr. Luttrell, who was on the floor of the House all day, is still confident that victory will be won before the end of the session. Mr. Caminetti does not appear to be at all downcast at the result. Indeed, as he himself said, he had been warned by the speaker that it would be difficult to get a quorum; but after consultation with a few friends, he decided to bring up the bill anyway, and if it was beaten it could be made to go over as unfinished business, which would be an advantage in itself. The bill has been changed since first introduced. The appropriation carried as it now stands is $10,000.

The National Mining Congress.

The National Mining Congress opened at Helena, Montana, on Tuesday, with C. S. Chase of Nebraska as temporary chairman. He stated that the object of the Congress was to advance the interests of mining and to urge the passage of a free coinage bill in Congress. Governor Toole of Montana made an address of welcome to the delegates, and spoke also on the advantages of free coinage. F. G. Newlands of Nevada spoke in the same strain and of the benefit of the mining States uniting and working together to secure decisive results. On the second day of the session a permanent organization was effected by the election of Francis G. Newlands of Nevada president. On taking his seat, Newlands made a strong silver speech, urging the mining States to put the interests of silver before party interests, and formulating a plan of how party organization could be preserved in each mining State and the people still be able to use their power to advance the free coinage of silver. This could be done by an agreement that the electoral vote of the mining States should be cast for no person as President who would not agree to permit any silver law passed by Congress to become a law. Newlands' view was that all three of the national parties in the mining States should instruct their electors to act independently of the electoral college in the interest of the silver cause rather than in the interest of any candidate. He claimed that, even though the election were thrown into the House the cause of silver would not necessarily be lost if the friends of silver would be active and vigilant. While it is true that the present House was Democratic, most of the Democratic members of the present House represented Southern and Western constituencies, which were overwhelmingly for free coinage. They would be candidates for renomination and election at the coming election, and pledges should be exacted from all such candidates for reelection that they would not, in the event of the election being thrown into the House, vote for any man for the Presidency unless he would give assurance that the executive power would not be against the popular will. While the Mining Congress was in session on Tuesday at Helena, free silver was shelved for the present by the National Congress at Washington.

Congress and the Mining Interests.

Congress has not treated the mining interests of the country very well this week. Free silver was shelved for the session, and the hydraulic mining bill was put off in such a way that it will very probably go over until Congress convenes again.

As to the free silver bill there is no doubt a very strong opposition to it in many quarters, and it will be a difficult job for the mining States to get it passed. Indeed, they have had very hard work to get it as far as they did, but its passage by the Senate last week, revived the hopes of the silver miners, only to be dashed by the action of the House. The subject having become one of political controversy, the miners have been forced to enter the field of politics themselves. The silver leagues throughout the mining regions and the Mining Congress have resolved only to vote for those in favor of free silver, and will desert the two old parties entirely.

As to the hydraulic mining bill, a very hard fight has been made by the California miners. Sufficient votes have been pledged to pass it, but owing to parliamentary practice, under the rules, the objection of a chronic objector stopped the passage of the bill. It has one more chance this session, but a slim one.

However, it is the opinion of many influential men favorable to the bill that it can readily be passed next session, especially since the amount of money asked for has been materially reduced. Meantime certain valley people of this State will meet in convention to throw their influence against the miners. This influence, however, will be much less than it formerly was, since it is seen that these people are narrow-minded and selfish and are pursuing a dog-in-the-manger policy. The miners no longer want to carry on the work as they did in years past, and only ask to be permitted to work these mines where it can be shown that no injury will be done to other interests. They want permission to build dams to restrain the debris, and some of the valley people do not want dams built, and object on general principles to mining being carried on. Their fight is made on prejudice, while the miners have justice and reason on their side.

The Powder Works Explosion.

On the morning of Saturday last, a series of explosions occurred at the Giant Powder works, near West Berkeley, by which the whole plant was entirely destroyed and five men killed. The resultant concussion exceeded in intensity anything of the kind ever experienced in California. The people in San Francisco, Oakland, Berkeley, Saucelito and other cities around the bay were seriously alarmed, the buildings being shaken severely, and quantities of glass being shattered.

The first explosion took place in the nitro-glycerin house, where three white men were manufacturing the substance. When this happened, those about the works fled for safety, and most of them had time to escape before the magazines exploded. The time elapsing between the explosions explains the small loss of life in an accident where many hundred tons of powder were blown up. Some six minutes after the first explosion, in the nitroglycerin house, the contents of the warehouses went off, close together. In these were between 150,000 and 200,000 pounds of giant and Judson powder. These latter explosions occurred close together, and it was these that caused the main damage as far as buildings, etc., were concerned.

The cause of the original accident in the nitroglycerin works is a mystery. The three men were sober, experienced and careful—the best in the business. As to the subsequent explosions there is a further mystery. Even when the nitroglycerin went off the giant powder remained intact, the concussion not affecting it. Six minutes after, however, either by the resultant fire or some other cause, it went off.

Concentrating and Refrigerating Machinery.

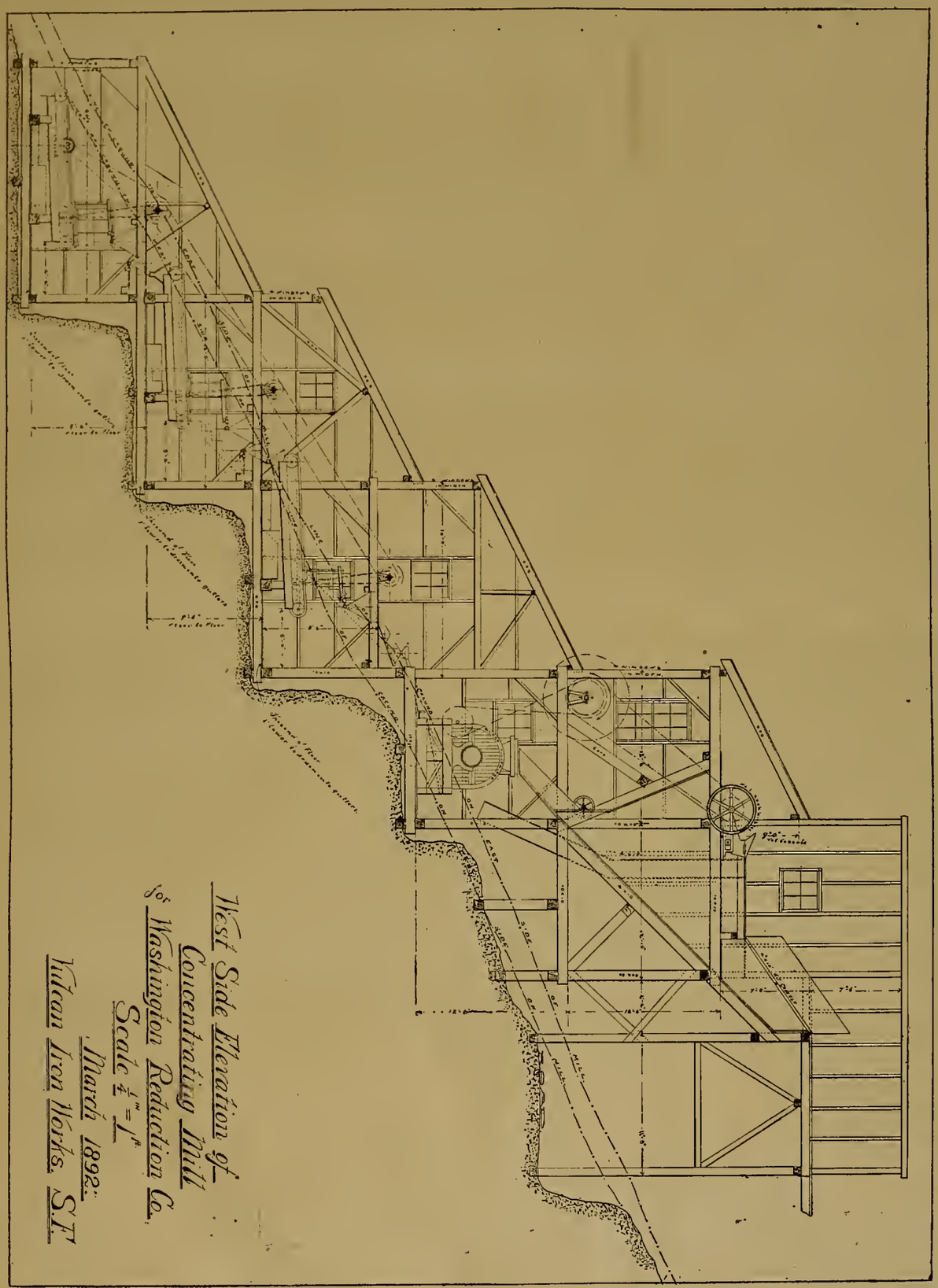
Foundry work is rather dull in this city just at present, and even the largest shops are not working very full-handed. More or less small work is of course going on, but there are few large contracts being carried on, aside from those on Government war-vessels.

A call at the Vulcan Iron Works showed that in some of their specialties, particularly in refrigerating plants, they are finding a good market at distances from this city. They have just completed a ten-ton refrigerating plant for the Doering and Marstrand Brewing Co. of Vancouver, B. C. Another plant of the same nature has been finished for the Williams & Barker brewery, Vancouver. One is also being built for a salmon cannery on the Skeena river, from which place they intend shipping the fish to England.

This is an ammonia machine working on the well-known compression principle which, all things considered, is perhaps the best. Quite a number of these machines built by the Vulcan works are in use in various parts of the country and are all giving satisfaction.

The largest job under way at these works is the new concentrstiog mill being erected at the Ruby mines, Ruby, Washington, belonging to the Washington Mining Co. Mr. Luther Waggoner is supervising the construction of the mill. This mill, a sketch of which is given on this page, has a capacity for handling from 60 to 75 tons of ore every 24 hours, is operated by water power and equipped with the latest and best machinery most suited to the work required. The ore is brought to the mill by a Vulcan wire ropeway, about 6000 feet in length, and dropped on the grizzlies.

The coarse ore goes through two No. 1 Dodge rock breakers and thence to the ore bins, from which the ore is fed by Challenge ore feeders to two No. 1 Dodge pulverizers. This style of crusher was selected by Mr. Waggoner, after careful inspection of the work done by the Dodge pulverizers in various parts of the country, mainly by reason of the small amount of slimes they create, limited power required, freedom from expensive repairs, etc. After leaving the pulverizers the pulp goes over eight Frue vanners and passes through a system of separation, sizing, concentration and reconcentration. Great attention is paid to the sizing of the material in each concentration, the concentrators being regulated to suit the differently sized materials coming from a set of point sizing boxes. Special sampling machines are employed, which are automatic in their action and allow great scope in the division of the sample. The Dodge pulverizers and rock breakers were furnished by the Parke & Lacy Company, for whom these machines are manufactured by the Vulcan Iron Works. All the balance of the machinery in the mill, except the special patented machinery above noted, was furnished and manufactured by the Vulcan Iron Works.



A Silk Mill.

In Petaluma, Sonoma county, is now being constructed the only silk mill west of Chicago. The new factory is now being made entirely of brick and is to be completed by September 15th, the main building being 45x160 feet, containing two stories and 140 windows for plenty of light. The builders, Hedge & Paff, have the contract to complete the structure for $20,394. Carlson & Currier, the manufacturers of San Francisco, have received $12,000 in cash and a block of land from the good people of Petaluma to locate there this promising industry. It was long ago hoped that we would produce enough silk in California to keep a number of factories running, but silk culture on any extended scale has not made much progress here, though all the experiments were apparently successful. The silk which will be used as raw material in the new mill, all comes from China and Japan, and costs $3.40 per pound.

It is a hopeful sign for our future industrial prosperity to see the establishment of factories in the smaller cities of the State. Every one of these started gives employment to a number of residents, who permanently locate their homes. The great need of many of our interior towns is small factories of various kinds, but within the past few years enterprises of this character have become more numerous. All this is an indication of the gradual building up of the State in a good direction.

THE CYANIDE PROCESS is interesting a great many people connected with mining in all parts of the country. We have endeavored to gather as much information on the subject as is available, but there are doubtless some with experience in actusl work or tests who could add much to the stock of information. We should be very glad to hear from any one who has anything to communicate. He may he sure of the attention of a large circle of readers, who may respond with information of further value. The subject has by no means been exhausted, since continued experiment and trial of this process are going on and much of importance may be developed.

A DELEGATE from the Cœur d'Alene Miners' Union is in town to confer with the owners of the Bunker Hill and Sullivan mines, but as the militia has gone up to the region, the present settlement of the question is rather out of the hands of the Union.

Mines of Calaveras County.

From Our Traveling Correspondent.

Part II.

TO THE EDITOR:—Going north from Murphys the mines on Indian creek are the first encountered. The old Calaveras is still idle. The Right Bower, which is the extension west of the Calaveras, has had a tunnel driven 300 feet on the Left Bower vein. The rock became very hard and the superintendent, W. H. Clary Jr., has closed down until power drills can be put in. On the Washington Mr. H. H. Harris, the superintendent, is still hunting for good ore; in the meanwhile the mill is idle.

SHEEP RANCH.

The mine of the place is the old Sheep Ranch mine, W. H. Clary superintendent. The shaft on the Sheep Ranch mine is now down 1200 feet. On the 1000 and 1100 foot levels the ore shoot is 1200 feet long. The vein, like its gold values, constantly varies. The vein will pinch to nothing and swell to three feet with an average of ahout 18 inches. The quartz is irregular in its value hut high in its average. This property is one of the oldest and hest mines in the State; its product to date coming close to $4 000,000. With the showing in depth on the Sheep Ranch mining operators should feel safe in taking hold of the different prospects in this section and fully developing them. Among the most promising prospects are the Chas. Anderson and Tom Smith mines.

THE CHAS. ANDERSON.

G. Rodaseni of Mountain Ranch is owner of the claim. The mine is three miles west of Sheep Ranch and is helieved to be the main ledge of the Sheep Ranch mine. The property is opened hy an 80-foot shaft on a 20-inch vein of ore that mills $10 a ton in free gold. There is alsn a tunnel now in 200 feet on the vein.

THE TOM SMITH MINE.

G. Rodaseni of Mt. Ranch is proprietor of this mine. It is hut half a mile southwest of Sheep Ranch and is thought to he a hranch of the Sheep Ranch mine. The property is opened by a tunnel 300 feet long, which cuts the vein 150 feet deep. The vein—like the Sheep Ranch mine—runs from three inches to three feet. From this mine two crushings have been made that yielded in fine gold $14 a ton from one lot of 90 tons, and $20 a ton from another lot of 57 tons. There is another tunnel started which, when in 400 feet, will cut the vein 600 feet deep.

At El Dorado the Postmaster-General has named the place Mt. Ranch, but the old-timers will have none of it, and El Dorado it is still called.

THE ROSE HILL MINE.

This mine (G. Rodaseni, proprietor) consists of three full locations of 600x1500 feet and a five-acre mill site. The property is ahout two miles west of El Dorado. Mr. Rodaseni has shown his faith in the property by sinking 172 feet, driving a drift from the hillside on the vein 800 feet, and running a level on the veln from the base o. the hill a distance of 1000 feet. In the upper level the vein runs from six inches to the width of the drift, and averages $4.50 in fine gold by primitive milling. The sulphurets were not saved. The mouth of the lower level was caved and I could not get in to the level, hut was assured that the vein was here 15 feet in width and carried a large per cent of sulphurets that "go $124 a ton." There is an old ten-stamp mill on the mine which was evidently a good gold-loser.

GASTON HILL MINE.

The Gaston (G. Rodaseni, proprietor) is two miles south of El Dorado. The mine is opened by shaft 103 feet, with drift run on the vein 70 feet. The vein runs from six inches to three feet in width. The quartz from this mine is "lousy with gold." After separating all the rich rock, that remaining will mill $30 a ton. Mr. Rodaseni has a candle box of quartz from this mine that would he a credit to a World's Fair exhibit, as some of the specimens are more gold than quartz.

THE RITTER MINE.

G. Rodaseni is also proprietor of this mine. The Ritter is two miles north of El Dorado. The mine was opened by shaft 100 feet, which showed a vein of from one to three feet in width. The mine was last worked in 1858, when by the milling methods then employed the quartz gave $7 a ton in free gold, no sulphurets being saved.

All of the mines in the Sheep Ranch and El Dorado districts are in slate. The entire section has water for power which is sold at very reasonable rates. As will he seen, Mr. Rodaseni is the principal mine owner in the section. Owing to old age and a large amount of other husiness, Mr. Rodaseni is desirous of closing out all of his mines on satisfactory terms.

RAILROAD FLAT.

Since the days of the old Petticoat mine, with its three-foot vein of $100 quartz, the prospectors have stood hy the camp, and at this time everything points to a suhstantial reward. While the average vein is not large, the smallness of the vein is more than counterhalanced hy the high grade of the quartz, and, with a slate country rock, the expense of extracting is not great. It is commonly reported that in the old Petticoat mine the shaft left the shoot at the 200 foot level and pitched north. The superintendent sunk to 300 feet and drifted south; not finding the shoot there the mine was shut down and is still idle. It may seem strange that a three-foot vein of $100 quartz should he left open to location all this time, but there have been very few miners in the section ahle to reopen and prospect the mine. It looks like a good thing.

THE BALD EAGLE.

J. E. Enright is superintendent of this mine. It is two miles north of Railroad Flat. The vein is opened by tunnel from the side of the mountain 700 feet long. From the end of this tunnel a shaft has been put down 100 feet, giving a depth of 350 feet vertically on the three-foot vein. The superintendent is now crosscutting to the west vein. The mine has a complete 10-stamp water-power mill, and the situation of the mine is all that could he desired.

THE MCCANDO.

Dr. C. H. Beales is owner. The mine is in Railroad Flat, and the doctor has the shaft down 80 feet. A tunnel has heen driven 300 feet to tap the water in the shaft and the drift extended from the shaft a distance of 100 feet on the vein, showing an average width of two feet of quartz that yields an average of $12 a ton in free gold. A wing is now being put down on a shoot of ore that carries $60 to the ton and bids fair to repay the doctor very handsomely for his outlay. The Dr. has in operation an arrastre that crushes the ore from his own mine and that of a number of nearby mines.

KEYSTONE.

H. S. Ellsworth & Co. are proprietors of the claim. The mine is in Railroad Flat and is opened by a number of shafts. The one through which the mine is now heing worked is 100 feet deep with drift run 200 feet on the vein, which averages 12 inches in width. For a distance over 400 feet on the vein the quartz has averaged $30 a ton in free gold, which, in slate formation, makes it one of the nicest hig—little mines in the State. A French gentleman has discovered very rich quartz on the extension to the old Fine Gold mine and is doing very well with his two arrastres. It is reported that J. B. Haggin will start up the Fine Gold mine this season. Railroad Flat is a good poor man's camp with its high grade quartz in slate country rock and at the same time is a good point for investors wanting a good little mine.

WEST POINT.

There is very little "point" to West Point at this time. The camp is dead, hut while dead she gives promise of again awakening. The Blazing Star with its eight-foot vein of $125 ore is tied up in litigation. The Lone Star is doing developing work with the mill idle. Some Grass Valley people under the title of the Eureka Mining and Lumber Company are getting into shape to work several mines, while the Moore & Nixon mine is working a small force. I have never found West Point as dull as this time, but she's that kind of a camp, either up—way up—or down—way down.

Perhaps the most satisfactory statement of the actual value of the county's gold mines is that of the San Francisco Mint, which shows that the Sheep Ranch mine yielded $130,780.73 in 1891. The Utica $451,121.61 in 1891. That the entire output of the county for 1891 was $743,744,77—an increase over 1890 of $122,424.77 in 1891, while the output of the county from 1880 to 1891 inclusive is $6,963,962.25. It is a safe prediction that the output of 1892 will come up to the round million.

PINE LOG DISTRICT.

This section is ahout two miles northwest of Copperopolis, and is, I think, the lowest in altitude of any quartz mining district in the northern part of the State. To drive through field after field of grain and then come upon a quartz mine in full operation is as unexpected as it is uncommon. But right here in the plains is a belt that carries large veins of gold-bearing quartz which in the past have heen worked in a superficial manner with varying results. Mr. I. R. Wilhur and associates secured four locations on the belt, and under the title of the Royal G. & S. Mining Co. started in to see what there was in the section. Mr. D. Jutton, the superintendent, soon had a shaft down 185 feet and a drift of 125 feet run on the Royal, which proved it to be a vein of from 1½ to 12 feet with an average of 6 feet of fine ribbon quartz carrying 1½ per cent of very high-grade sulphurets. The rock carries very little free gold and is similar in this respect to the Golden Gate mine of Sonora; but whereas the former operators made very little out of the mines on this belt hy working the ores solely for their free gold contents, under Mr. Jutton's management the sulphurets pay nicely; and although the mine is but heing developed and equipped, thus early they meet all expenses. Once the mine is thoroughly developed and the mill increased to 40 stamps, the mine bids fair to rank as one of the best in the county. The situation is all that could be desired, right in the plains, with the railroad surveyed in sight, free water for milling, wood $3.50 a cord, supplies and labor very cheap, nothing more could be desired. The mine has now a 10-stamp mill with two six-foot Frues.

E. H. SCHAEFFLE.

A Hydraulic Giant and a Fire.

ANGELS, CALAVERAS CO.

TO THE EDITOR:—On the night of June 8th a fire broke out in the hlacksmith shop of the Utica mine. In less time than it takes to write it, the flames had reached the adjoining machine shop and then ignited the warehouse, filled with inflammable oils. The uoited heat aod flames from these three huildings ignited the gallows frame and a sheet of flame ran to the top of the hoist. At this time it looked as though the fine 60-stamp mill, which was but 50 feet distant, was doomed, and in all possihility, all Angels as well. Luckily, during the past, the superintendent had set up an old hydraulic giant in the rear of the mill, to sprinkle down with. The giant, when first put into use, had shown its power, under the 400 feet of pressure given it, hy lifting one end of the office roof and ventilating the mill by removing any window that chanced to come in the line of its aim, and was soon given the respect due its force.

When the flames shot up to the top of the hoist the giaot was turned loose and sent a solid stream of 300 inches of water clear across the top of the mill buildings and over the top of the hoist, 300 feet distant. The giant's stream swept out the flame, wherever it could reach it, in an instant, but unfortunately the giant could not he made to turn its stream around a corner, and in consequence the fire hlazed away where the giant's stream could not reach, until the hose on the opposite side of the mill was brought into service and the fire squelched. All credit is due to the good work done hy the old giant; but for it and its powerful stream of water the fire could not have heen checked and there would have been an immense loss to record.

Once the fire was out it was found that the hoist was only scorched, the mill uniojured, hut the hlacksmith shop, with all of its appliances, was gone. The machine shop, complete in every detail, with all the neccessary lathes and tables, was consumed, together with a complete electric lighting plant that was stored in the shop. The adjoining storehouse, with all of its supplies, was a thing of the past. The loss is difficult to estimate and can hest be got at by the cost of replacing the property destroyed. Luckily, there was no powder in the huildings at the time of the fire.

While the fire is a severe loss, the owners feel that they have every reason to congratulate themselves that it was not worse. With this experience they can arrange to prevent its repetition, or to better check any fire that may occur in the future. With two more giants so placed as to command the three angles occupied by the mine's buildings, a fire could not live, as a stream of 300 inches under 400 feet pressure would not only put out any fire, hut could be made to utterly demolish the building on fire. Here's to the much abused hut ever faithful old friend of the miner, "the hydraulic giant."

E. H. SCHAEFFLE.

A Mammoth Gold Deposit.

SALMON CITY, IDAHO, July 9, 1892.

TO THE EDITOR:—A stranger, looking up the main street of Salmon City on the evening of a clear day, when the sun is just setting, could not help heing struck by a prominent object cropping out of the foothills on the east side of the valley. It looks at that distance (16 miles) like a huge bank of yellow clay, hut a closer examination proves it to be an almost vertical cross-section of a sedimentary filling in an ancient river channel, that has heen cut down and partly eroded away hy a mountain stream that runs across its course.

It leaves an almost vertical bluff on the south side of the creek, that is 300 feet high and 800 feet wide, of what is supposed to be a volcanic ash or sediment. It forms a soft, silty rock that hreaks with a conchoidal fracture, without any grit in it coarse enough to dull a pocket-knife, with which it can be easily shaved. The bluff has heen slightly disturbed and faulted, but still shows horizontal deposit lines, as if it had been deposited by a slow-flowing current of large volume. In the absence of anything stronger to examine it with, it appears under a quartz glass to be composed of an exceedingly fine sandy mud, mixed with fine, transparent, scaly particles that look like the fragments of bursted volcanic bubhles. Some samples of the material were tested for lime, but they soak up hydrochloric acid like a sponge, without giving any perceptible reaction. This ancient river channel occupies what appears to he a synclinal trough, that coursed through a thick hed of cemented gravel, that shows up over 100 feet thick in places, and dips at an angle of from 30 to 50 degrees under the sediment from both sides of its course. This is underlaid again hy a series of thin beds made up of soft sandstone and clays, with fossil roots, ferns and leaves, and occasional thin beds of hituminous shale. The whole secondary formation of the valley looks like an ancient lake deposit, that has been tilted at different angles by suhsequent volcanic action.

This sediment bluff, with its 200-foot bank and cement bedrock, is virtually a placer deposit, and if I were to say that it sampled at the average rate of over $2 per cubic yard, or ahout $1,000,000 per acre, it would seem like an extravagant assertion. And yet the samples that were tested and indicated that result were quite fairly taken, in the following manner: By digging away the weathered surface with a pick, and taking out a chip every ten feet, up one side and down the other side of the hluff, with a few samples at intervals across the top. I did not take any across the base of the bluff, for the reason that the best assays of hand samples had been gotten from there, one of which went exceptionally high, probably owing to having been taken from near the hottom of the deposit. I was afraid a sample from there would make the assay misleading. The chips, amounting to 20 pounds were mixed up, pulverized and carefully sampled down, and the two opposite quarters on the last cut assayed. They varied only five cents, and the results were $1.25 and $1.30 per ton respectively. From this hluff west it is about two miles to where another creek cuts down through the course of the old channel, exposing another deposit of the same identical material, that is wider but not so high. A dozen pieces taken up through the center of this bluff sampled $1.50 in gold, and an average sample taken from a shaft that is sunk into the deposit between the two creeks assayed about $1.20 per ton.

This shaft was being sunk hy the owners of the ground at that point, in the expectatioo of finding a rich bed of free gravel under the sediment. They reasoned that it ought to be there, from the fact that of three creeks that have been successfully worked for placer gold, the pay has been found to extend above where this channel crosses their respective courses. The shaft passed through a hed of light blue gravel that carried some fine gold, but not enough to pay. They got down 30 feet without getting through the sediment, wheo they had to quit on account of the water coming in so rapidly.

A peculiar feature about this sediment and one that may have some scientific significance in this connection is, that all the samples tested showed more or less silver, and made an average nearly equal to the gold value. By panning, it is only one in about a dozen several ounce samples that after being pulverized shows any free gold, then it is in very fine, round particles that look like the float gold in the shifting bars of the Salmon river; but every sample shows a good prospect in hlack sand that may carry most of the value. Some of them also carry a heavy gray sand that hangs behind the black sand and is suggestive of

some of the rarer metals, for below where this old river course enters the Salmon river canyon, the rocker diggers get good prospects of a fine, bluish-white metal that hangs behind the gold in a pan, and must be either platinum or iridium, or both.

Aside from the sands mentioned it does not show the indications of anything base, but is the same composition throughout, with the exception of a little change in shade, some of the layers show a lighter brown than the general mass, and some a steel gray. Of course the results mentioned are exceedingly low for any material that has to go through a crushing process, yet it would crush as readily as most anything in a solidified form. If it were run through rock breakers, then dropped into a flume and conveyed about a mile by water on a steep grade over iron riffles, it would be worked out to a free running pulp, which, with the addition of more clear water, would be in an ideal shape for amalgamation and concentration. In this manner it could be worked very rapidly.

The natural conditions of water power and position, etc., could hardly be improved on if arranged to order, and when one considers the economical achievements of the Dalmatia, Spanish, and other California companies in handling low grade ores, where thousands of tons are mined and milled at a cost not exceeding 50 cents per ton, there is still quite a margin to work ore over that figure, and an interesting proposition to say the least, when its extent comes to be considered.

This old channel can be readily traced for 15 miles, showing in bold bluffs on the sides of the creeks that cut down through its course, in each case having the same foundation and general appearance. Mr. John M. South of Pratt Creek, one of the principal owners of the ground where the assays were taken, thinks he can trace it 50 miles. He has an idea that it was originally a large stream flowing through this valley from the North Snake river lava plains, and there is reason in his theory. The same cosmic forces that caused the sinks of the Big and Little Lost rivers, Birch creek and John Day river may at some earlier period have elevated the country about the heads of the Lemhi river and Birch creek, and changed the flow of what was probably once the largest, as it would be the most direct, branch of the Salmon river. There certainly must have been at one time a much larger volume of water flowing through the Lemhi valley than at the present time, while the lithological character of a large proportion of the wash gravel in its wide bars are foreign to the formations that underlie its present drainage.

If this sedimentary matter could be made to yield its gold value with any reasonable profit, there is enough of it virtually in sight to supply works of almost any imaginable magnitude, that would give employment to thousands of men and develop an industry of national as well as local importance. It is a proposition that is worthy the investigation of mining and metallurgical experts who may have the leisure to look into it.

Our placer mining boom continues to improve, and is resulting in some extensive and permanent developments, while there are new strikes being heard from every day. The quartz interests here are also receiving a close overhauling by the representatives of American and foreign capitalists. Mr. John Ely, of Nevada fame, is in the field. He has just about consummated a sale of the Lincoln group of mines, adjoining the famous Yellow Jacket property. The Lincoln is described as a huge porphyritic reef, carrying free gold to the value of $10 per ton, together with a good percentage of rich concentrates that have been tested and yield readily to the cyanide process. R. B.

Suum Cuique.

SAN FRANCISCO, July 5, 1892.

TO THE EDITOR: Your issue of July 2, in giving a timely and very interesting summing up of what seems to be known of the "Cyanide Process" contains among other articles one copied from the *Engineering and Mining Journal* of December 29, 1888, entitled "Cyanide of Potassium as a Lixiviation Agent for Silver Ores and Minerals." By the accidental omission of "Jr." attached to the name of the author, this article was apparently credited to myself instead of to my son, Louis Janin, Junior. The necessary correction was made in the succeeding issue of the *Journal*, January 5, 1889. Furthermore, the experiments referred to were made in 1886, and not, as wrongly quoted, in 1866.

LOUIS JANIN.

The Technical Society.

The Technical Society of the Pacific Coast held its last monthly meeting at their rooms in the Academy of Sciences building. C. E. Grunsky, presided. New members were elected as follows: M. P. Boss, mechanical engineer, of San Francisco, and G. W. Sherwood, civil engineer, of Riverside. W. R. Phillips, draughtsman, of Seattle, was elected associate member. Edward Lownes, formerly assistant city engineer of Los Angeles, now of Riverside, and William H. Sanders of Pomona were proposed for membership. The murder in Mexico of Andrew Fraser, a member of the society, was reported, and R. S. Moore, superintendent of the Risdon Iron Works, L. G. Russell, of H. P. Gregory & Co. and E. A. Rix of Rix & Birell were appointed to draw resolutions of regret and sympathy. A paper was read by Mr. Hugo P. Frear entitled "A problem in launching the Pacific Mail steamer Peru at the Union Iron Works." The paper was illustrated by a diagram of scales and curves and explained in strictly technical terms what goes on during the process of launching, the distribution of weights and the displacements at various stages. There was no discussion of the paper, as it presented merely a series of facts and computations. George W. Dickie and his brother, James Dickie, complimented Mr. Frear very highly on the research shown by him and upon the clearness of his essay, and the society passed a vote of thanks to the author.

Pioche District, Nevada.

At last things are looking very much better for Pioche and vicinity, says the *Record*. All the mines in the district and in the districts surrounding this are looking well, and many strikes of rich ore have been made within the past 60 days. Manager John C. Eames of the Pioche Con. M. & R. Co. states that while the properties of the company are not being worked as extensively as we might wish, yet what work is being done is daily proving up new and rich bodies of ore. The Pioche smelter has been running for the past 50 days, and at a handsome profit to the company. Most of the ores treated at the smelter on this run are the ores which were taken out in the development of the different mines. No effort has been made to make a large tonnage, especially from the Pioche Consolidated Co.'s properties.

All the ore smelted from the old Day mine has been drawn from the overproduction of the last few months, and although the mine is practically closed down, there are still over 3000 tons of ore in the bins ready for shipment. Probably the largest producer in this district is the Yuba. Only such ore as has been taken out in development has been shipped to the smelter, but from this ore there has been a net profit of over $20,000 during the last 30 days, and the mine in every particular is improving, both in grade, quantity and the amount of ore in sight, the last mill-run netting over $200 to the ton.

The No. 3 Meadow Valley shaft has recently been opened and active work is being done. About 15 men are employed cleaning out old drifts and in spiling from the crosscut on the tenth level on the Mazeppa vein to connect the Mazeppa shaft. In the last few days, very rich lead ore has been encountered, which, in early days, was considered too base for milling. The last assays from the ground opened run from 40 to 50 per cent lead and from 400 to 500 ozs. silver. A force of men has also been put at work on the old Lightner—or Raymond & Ely—shaft to retimber and put the same in perfect working order. It is possible that the company may conclude to start active work on the property. In such case, a large and modern mill will be built to treat the ore, of which there are hundreds of thousands of tons in sight. This ore, treated economically and properly, will yield a very handsome profit, but in the old days it was too low grade or contained too much lead to be handled at a profit with the facilities then at hand.

The smelter during the last few days has been treating the old Bristol slag, and putting through, with a low grade zinc ore from the Yuba, from 80 to 90 tons daily. As there are but a couple of thousand tons of slag remaining, the smelter will shortly treat the straight ores alone, and have all it can do.

There is certainly a better feeling in Pioche, and many mine and prospect owners are working their properties and endeavoring to find a sale for their ores. Of course the recent activity is due to the certainty almost of getting railroad connections with Salt Lake in the near future.

THE YUBA MINE.

In driving east on the 1300 level of the Yuba, a fine body of rich lead ore has been encountered over 300 feet from the shaft. Recent assays have run over 40 per cent lead and 120 ounces of silver to the ton. An upraise has been started, which is now 20 feet above the level, and the ore has widened out from six inches to over three feet. This is considered a very important strike, as it is virgin ground clear to the surface, and the ore found is in an entirely new and heretofore undiscovered ore chute and the principal workings of the mine lie to the west of the shaft.

The Yuba mine, owned by the Pioche Con. M. & R. Co., is certainly in luck. Recently it was desirable to get about ten tons a day of low grade zinc ore for the smelter, on account of the sulphur it contained, to mix with a high charge of Bristol slag. Just such ore was available on the 1200 level, and stoping was commenced. After taking out a couple of hundred tons, the low grade zinc ore turned into high grade lead ore, the pay streak being from three to five feet thick and extending along the level for over 150 feet. It can veritably be said that the Yuba is now or soon will be in bonanza.

REMARKABLE MINES.—There are many coal mines of which the galleries extend under the water of rivers, such as the mines near Leige, in Belgium, of which the galleries form a connection of the mines situated on both sides of the river, regular subaqueous tunnels; but more remarkable are those mines of which the galleries extend under the ocean, as is the case with some coal mines in England. More remarkable still is one of the coal mines at Nanaimo, on Departure Bay, beyond Victoria, British Columbia. This mine is known as the Wellington, and its galleries are situated 600 feet under the surface of the ocean, which here surrounds an archipelago of islands, very similar to the Thousand Islands, at the head of the St. Lawrence river. The length of the galleries of this mine is continually increasing, and extends at present six miles under the bottom of the waters of the Pacific Ocean. Nearly the whole population of the town of Nanaimo, amounting to nearly one-thousand, is engaged in the mines, and earns as much as $3 to $6 a day. Liberal as this appears to be, the cost of living in that inhospitable region is so high that the miners can only make ends meet. A great drawback in the mines is the excessive amount of combustible gases, by an explosion of which, three years ago, 100 miners lost their lives.—Coal Trade Journal.

COINAGE OF THE MINT.—The local Mint coined during the fiscal year just closed $25,593 983, consisting of $21,165,500 in double eagles, $1,155,000 in eagles, $1,079,500 in half eagles, $876,000 in standard dollars, $315,794 in half dollars, $676,020 in quarter dollars and $326,169 in dimes. The coinage during the previous fiscal year was $31,212,292, and the grand total since the local Mint was established in 1854 amounts to $952,274,338, of which $822,146,407 was in gold and $130,127,939 in silver.

The Copper Combination.

On the whole, the comments made by those authorities in the copper trade who are not directly connected with the producers are unfavorable to the international agreement, which to some extent partakes of the character of the "gentlemen's understanding," at one time conspicuous in another leading American industry. The great mining companies on both sides of the Atlantic have come together, and have practically decided not to crowd the market too much. According to English advices, the European companies, representing about one-half the total production, have agreed to place a limit on their production, in some cases reducing by five per cent that of the year 1891, while in others they have been allowed an increase, amounting in one instance to ten per cent. We believe that this deals practically with the large Spanish mines. At first the Europeans held out for some promise that the exports of American copper be placed at a certain maximum. This, as we understand it, they failed to carry, so that they must be content with hoping for the best in view of the restriction of the American mines. It is reported that nine companies, controlled by five interests, have undertaken to keep their output for one year from July 1st down to 226,000,000 pounds. These are the Anaconda with 75,000,000 pounds, the Calumet & Hecla with 60,000,000 pounds, the Bigelow-Lewisohn with 65,000,000 pounds, the Parrot with 14,000,000 pounds, and the Quincy with 12,000,000 pounds. This includes the majority of those who place large quantities of copper abroad. As we pointed out some time since, these interests made in 1891 204,000,000 pounds, so that the "restriction" did not look very formidable.

We believe, however, that the record of the first six months of the current year will show that, as a matter of fact, a yearly product of 226,000,000 pounds is very much below the rate which they have been running at, and that full work would carry the figures higher still. We have the data to estimate the product for the first six months of 1892 of the Calumet & Hecla, Quincy, Tamarack, Osceola and Kearsage on Lake Superior, and the Anaconda, Boston & Montana and Parrot, at not less than 140,000 000 pounds. For the greater part of the time the Butte & Boston was idle. With that plant going and all the others running at full capacity, the interests alluded to would put on the market during the year beginning July 1, 1892, not less than 300,000,000 pounds of copper. If they adhere to their agreement to produce only 226,000,000 pounds, they will keep the European market from a very dangerous collapse.

At first blush, this arrangement of a few interests, leaving out very important groups of mines, may seem a very weak one, but it must not be forgotten that they are practically the ones which are the heavy exporters. Really the only great concession has been made by the largest Montana concern, and, generally speaking, the producers of the Butte district are in a position where it is imperative with them to export largely. There are not in this country now refining facilities large enough to take care of all the Montana matte made, not to speak of the material which would be produced running full. A large share of the product must go abroad, and if the American mines were to go on at their full rate, they would swamp the European market, which would very seriously react on our own.

It is well known that this condition of affairs will not continue indefinitely. The leading Montana concerns are now getting ready to do their own refining by building electrolytic plants. The large establishments which this calls for cannot be created in a day; in fact, years may elapse before they cease to ship their matte to foreign countries. But the day is coming when the exports of copper matte will be as unimportant as those of ore now are, and American copper will go out in ingots, wire bars and slabs. Then the American mines will be the absolute dictators in the world's copper markets.—Iron Age.

IN THE LAVA BEDS.—Probably no other part of the world, excepting, perhaps, the Yellowstone Park, contains so many natural curiosities as Modoc county, Cal. The first, from a historical point of view, is the famous lava beds—scene of the Modoc war—a country of rocks, so full of caves that lakes and rivers are swallowed up, leaving nothing but a faint murmur to show their course through the bowels of the earth. In many of the caverns an army of men could hide, and in some places the intense heat of the rocks is evidence that internal fires are raging. In all parts of the county can be found mammoth hot springs, belching forth water strongly impregnated with minerals, and often close by will be caves of the purest ice. Medicine lake is a wonder that draws many visitors annually—a body of water that does not contain a living thing, and at certain hours of the day is full of a gelatinous, sponge-like substance that sinks and leaves the water clear. At the lake are two mountains—one of pure obsidian, the other of pumice stone, in layers.—Potter Four Corners.

THE COAL TRADE.—The private circular of I. Stewart gives the receipts of coal at this port in June at 85,900 tons, against 96,070 tons in June, 1891. The arrivals during the first six months of the year amounted to 607,800 tons, against 677,020 tons during the same period in 1891. The circular says: "The coal market continues in a depressed condition, with diminished consumption and little indication of any early improvement on the present low prices ruling, in consequence of foreign coal being offered for present and future loading at prices that preclude any advance for some months."

THE inevitable reduction of miners' wages which must be the result of low silver prices, has come. In all the leading mines of San Juan county, Colo., notices were posted last week that wages would be reduced 50 cents per day. This move was the only possible solution of the problem, if the mines are to continue at work, because, except in a few cases, silver cannot be produced at its present price.

MECHANICAL PROGRESS.

The Masonry of Boiler Settings.

The brick work about boiler settings is often very imperfectly laid. It is mostly done by contract, with no one to supervise it who understands the severe use to which it is to be put. The bricklayer, who may never have worked on a job of this kind before, builds good-looking inside and outside walls, but the space between is apt to be filled with odds and ends in the most promiscuous manner. Furtbermore, he puts the same joint in that he would use if he were building a house, and this is just what we do not want in a boiler setting, particularly in the fire brick lining of the furnace. The joints throughout the setting should be thin, and the work should be done as faitbfully inside as outside. Kaolin or prepared fire clay is used in laying the fire brick, and it should be mixed up so thin that it cannot well be used with a trowel. Some mill owners who have had experience in this direction will not allow a trowel to be employed at all, but require the men to use iron spoons. The fire brick should be dipped in water as they are used, so that when they are laid they will not immediately "drink up" the water from tbe cement. They should then receive a thin coating of the prepared fire clay or kaolin paste, and be carefully placed in position with as little of the kaolin or fire clay as possible. Every sixth course, beginning with tbe grates, should be a row of headers, well bonded into the masonry behind. The headers are of little use unless they are well secured into the walls of the setting, for when the lower courses nf fire brick have burnt away more or less, we have to rely on these headers to a considerable extent to hold the upper part of the wall in position. In repairing fire brick linings, the lower courses, which burn out fastest, can be removed and replaced without disturbing the upper part of the wall, provided the headers are secure, while if they are not, the entire wall may have to be rebuilt, and this cannot be done without either removing the boiler or tearing down a considerable part ot the setting.—The Locomotive.

Flying Machines.

Information reaches us through a reliable channel tbat Mr. Hiram Maxim's experimets, which he has been carrying on for some time in England, with a flying machine, are, for the present at least, at an end, no flying having yet been done, and the capitalists who were backing the enterprise having grown tired of the expense.

It will be remembered that Mr. Maxim some time ago gave some account of what had been done, in the *Century Magazine*. His article was modest in tone, and he refrained from doing much more than merely giving an account of what had been done; but it was all the more encouraging on that account, and there were undoubtedly very many who entertained great hopes that Mr. Maxim would be able to construct a machine that would fly. He may do it yet, but the present abandonment of his experiments does not look encouraging.

It seems more tban probable that if aerial flight is ever accomplished it will be done at a greater expenditure of power than would be required to transport the same loads at the same speeds by present means, but there would be, of course, great advantages in flight, which, for many purposes, would overbalance considerations of economy. It is quite certain that any device that requires a considerable expenditure of power merely to maintain its altitude or distance from the earth, must be at a great disadvantage as compared with present means of transportation, in which no power is required for this except that incidentally expended in overcoming friction introduced by tbe wheels and axles which maintain tbis altitude.

It will be recalled, doubtless, that Mr. W. H. Harrison has expressed the opinion in tbese columns that this wheel and axle arrangement was the ideal flying machine, and tbough the progress of a wagon over the surface of the eartb cannot be considered very closely analogous to flying, it may turn out to be about the closest approach to it that we shall attain. Nevertheless, all efforts to perfect a flying machine are not, of course, at an end, and intelligent perseverance often accomplishes wonders.—American Machinist.

A REMARKABLE LOCOMOTIVE BOILER.—A locomotive with a double-barrel boiler bas been designed by the mecbanical engineer of the Eastern railway of France, and has been built at that company's works. The lower barrel is filled with tubes, and is connected with the upper barrel by three necks and by tbe throat plate of the fire-box shell. The object is to have a boiler of large capacity without increasing the diameter beyond 4 ft. 4 in., so that it may fit between the driving wheels. The engine is of the eight-wheel type, with outside cylinders at about the middle of the engine, and driving the rear pair of driving wheels, tbis arrangement being considered best for high speeds. The valve motion is also outside. The four driving wheels are 6 ft. 6 in. diameter, and tbere is a four-wheel leading truck, with plate frames, and outside bearings. The engine is designed for hauling beavy passenger trains, and maintaining a continuous high rate of speed.

TRAINING MECHANICS. — The question why boys do not properly and thoroughly learn a trade in tbese days has been partly answered by an old employer, who says that boys, nowadays, are different from what they were when he was a boy. In the good old times they came to learn as much as possible, now to earn all the money they can. Then, apprentices were the children of comparatively well-to-do people, who took pains to bring their children up properly, and were more solicitous, by having their sons properly instructed and by making good mechanics of them, to make them independent of the world. Now, apprentices come mostly from the poorer classes, and are expected to bring home as much wages as possible, so as to help support the family. They only look for the immediate present, regardless of the future. The first question an apprentice asks is bow much he is to get a week; he thinks only of his earning capacity, and not of the time it takes to instruct him, nor of the materials he spoils. The next question generally is what hours he will have to work. The result is that is that employers now endeavor only to get as much work out of boys as they can, and take no interest in teaching them anything—in fact, boys in workshops, nowadays, are looked upon as so many necessary evils. When the employer ceases to be looked upon and respected as a teacher and educator, and only as an employer, tbere is an end of any hope for the proper instruction of boys in any mechanical trade. Times have changed, and with them old methods have passed away. We doubt very much if the newer methods are really an improvement. Time will tell.—Machinery.

RIVETED JOINTS.—The thorough and protracted experiments made recently with the famous Emery testing machine, relative to riveted joints, so far as American iron and steel are concerned, are regarded as determining the important question as to their value in practical work. In a series of five experiments with steel plates and iron rivets, holes punched, tbe sbearing resistance per square inch exhibited is stated to have been 39,740, 38,190 39,700, 38,638 and 41,100 pounds—the assumption being, in view of these results, that 38,000 pounds per square inch is a reliable estimate of the single shearing resistance of iron rivets in steel plates. This being the case, there remains to be determined the thickness of plate, diameter of rivet-hole and pitch of rivets, and in deciding upon these elements in the problem, it is necessary so to adjust the size and pitch of rivets as to make the shearing resistance of the latter as near as possible the strength of net section of the plate Computations show the efficiency of a single-riveted joint to be 56.6 per cent, and 63.3 per cent to be tbe efficiency of a double-riveted joint, while the efficiency of a triple-riveted joint is 75 per cent.—Manufacturers' Gazette.

DIVIDEND NOTICE.

The German Savings and Loan Society,
526 California Street.

FOR THE HALF YEAR ENDING JUNE 30, 1892, A dividend has been declared at the rate of five and one-tenth (5 1-10) per cent. per annum on Term Deposits, and four and one-quarter (4¼) per cent. per annum on Ordinary Deposits, payable on and after FRIDAY, July 1, 1892. GEO. TOURNY, Secretary.

AT A BARGAIN
For Sale Cheap, Six Second-Hand
FRUE CONCENTRATORS,
Good as New. Also Second-Hand
STEAM PUMPS
Of various makes.
RISDON IRON WORKS,
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SHEET IRON PIPE

IRON PIPE
ALL SIZES, FOR GAS, STEAM AND WATER.
— WE MANUFACTURE —
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For Water Supply, Mining, Irrigating Purposes, Stock Ranches, Etc.
Made in Lengths Desired from 16 to 30 feet.

The Cut shows a Section of Three Joints
DOUBLE RIVETED SHEET IRON PIPE.
In the manufacture of this Pipe, we use only a high grade n annealed Charcoal Iron of great tensile strength.
The weight or thickness of metal used, is graded according to service required, and pressure to which the Pipe will be subjected.

FOR ALL UNDERGROUND PURPOSES, we immerse the Pipe in a bath containing a special mixture of ASPHALTUM, PITCH and PETROLEUM, at a Temperature of 300° Farenheit. It thus receives a thorough coating, both inside and outside, rendering it impervious to the alkalies of the earth, rust, etc., and is practically indestructible.

CORRUGATED IRON,
Black, Painted and Galvanized, for Roof and Sides of
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THE BLASDEL
CONCENTRATING BELT COMPANY.

We have now made arrangements to have our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over *any others* will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that could otherwise escape with the tailings from a belt, the surface of which is entirely smooth. We can safely say that it is a better belt than has ever been manufactured for use on this coast. It will last much longer and will handle fully one-third more pulp than any smooth belt, and will save a higher percentage of sulphurets

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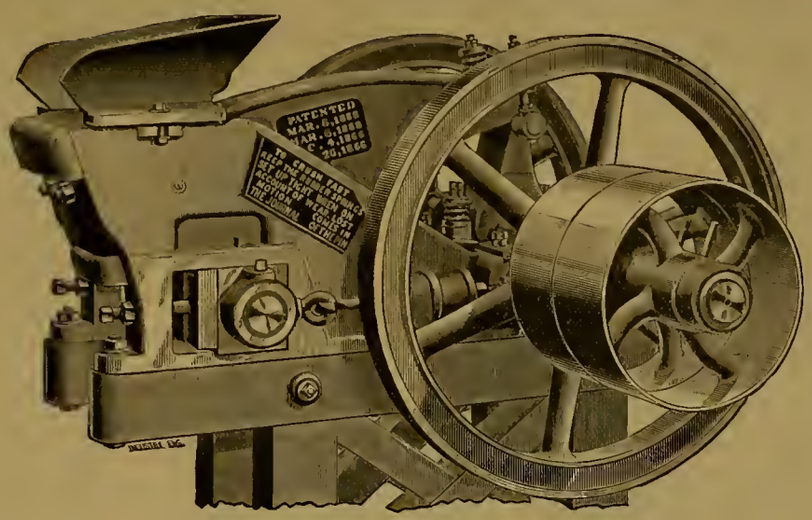

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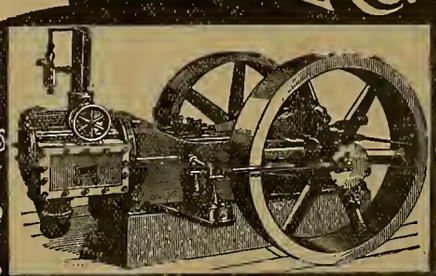
SMOOTH & QUIET RUNNING.



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RISDON IRON WORKS, Pacific Coast Agents, San Francisco.

SCIENTIFIC PROGRESS.

THE PHONOSCOPE.—It was announced some time ago that M. Dumeny had succeeded in taking instantaneous photographs of the lips of a speaker, and is recombining them in a sort of zoetrope, so as to reproduce the original movements, and enable a deaf mute to understand what was said. He has recently improved on the process, and invented a new apparatus for combining the images, which he terms a phonoscope. The changes of the lips in speaking are so rapid that 15 photographs a second are required to give a good result. Moreover, several sets of images for the same phase are taken, so that nothing essential should be omitted. The whole head and bust of the speaker is photograped, so as to get the benefit of the expression. In the phonoscope the positives are arranged around the periphery of a disc, which is rapidly turned by a handle. A second disc, having a single window in it just opposite the plates, is also rotated by the same handle, but at a much higher speed than the other. A beam of sunlight illuminates the plates from behind, and the observer, looking into the apparatus, sees them pass his eyes one after another in such rapid succession as to produce the effect of a single image endowed with animation. To this end, at least ten or twelve must pass the retina in a second. M. Dumeny is so far satisfied with his results that he looks forward to a time when we shall possess veritable "speaking likenesses" of our friends. In short, the family album will be a kind of phonoscope, and contain photographs which will not ooly smile, but speak, or appear to speak to us, as though they were alive.—Electricity.

NEW GLYCERINE BAROMETER.—A communication to the Royal Dublin Society, by Mr. J. Joly. contains the description of a new mercury glycerine barometer which he has invented. This instrument has the full range of the glycerine barometer. The total length of the tube is, however, only about 250 cms. This result is attained by surmounting the glycerine in the tube by a column of mercury 67 cms. in length. By means of a float in the mercury which pulls a disc, loosely fitting the tube, against the base of the mercurial column, this is kept from breaking and falling down through the glycerine. In a uniform tube this column remains of invariable lengtb, and moves up and down with the glycerine. The balance of the atmospheric pressure is equilibrated by glycerine drawn from a bath of glycerine into which the lower end of the tube dips. Owing to the short length of tubing traversed by the viscous liquid, the instrument is probably more prompt than the full length glycerine barometer. On the other hand, there appears to be a very slow ascent of the glycerine past the mercury, which will probably necessitate the resetting of the instrument at intervals.

REPORTS are current of the invention by a Frenchman of a method for obtaining cellulose and oxalic acid from vegetable fibres contained in wood. In consists in reacting on wood with dilute nitric acid, in the presence of sulphuric acid, separating the intermediate product from the acid liquor which contains in solution the oxalic acid formed, and subjecting the intermediate product to a further treatment, for the purpose of removing the remaining incrusting matters from the cellulose. In the management of the acid liquor the plan pursued is to set it aside and subsequently subject it to a process for recovering the oxalic acid. The latter, dissolved in the weak nitric acid, can be obtained direct in the crystalline.form by repeatedly making use of the separated acid liquors for the treatment of fresh wood.

VOLTAIC ELECTROMOTIVE FORCE.—Recent investigations of the most exhaustive nature have shown that the *dilution* of the liquid of a voltaic element by water or alcohol, the *liquefaction* of the positive or negative metal by mercury, or the *dilution* of nne metal by another, by forming an alloy, is invariably followed by an increase of the *mean* electromotive force of the diluted and diluting substances and, cnnsequently, also of the *effective* electromotive force of the diluted substance, provided that no cbemical reaction is produced in the mixture. The evident explanation of this general result is that by the action of dissolution or dilution the molecules of the active substance withdraw from one another, and, consequently, acquire a higher speed of motion, and this naturally increases the electromotive force. But, in the same ratio as the chemical reactions manifest themselves, the gain of electromotive force is diminished and converted into a loss, and this loss is the greater the more energetic the chemical reaction. The method enables us to distinguish chemical compounds in alloys, amalgams and electrolytes from purely mechanical mixtures.

A NEW APPLICATION OF PHOTOGRAPHY. A most ingenious idea, patented by Mr. J. Joly of Dublin, relates to the combination of a photographic camera with a sextant, etc., so that an instantaneous photograph can be made, sbowing at once tbe dial of a chronometer, the horizontal line and (a suitable screen being interposed) the disc of the sun. From measurements subsequently made upon the plate, the aogular distance between the sun and the borizon is, of course, to be deduced. It seems probable that, witb a suitable optical system and sensitive film, the horizon line, in dull weather, may be more readily located by photographic means than by direct vision. On the whole, the invention is of a very promising character.—Optician.

THE CHEMISTRY OF NICKEL.—According to Herr P. Schutzenberger, the atomic weight of nickel seems definitely fixed at 58.6. An occlusion of oxygen is observed in a constant manner with nickel-oxide calcined at white redness and finely pulverized. The greenisb-yellow oxide, moderately calcined, does not present it, no more than does cobalt-oxide strongly calcined. Reduced nickel obtained from the strongly calcined oxide, instead of becoming agglomerated under the influence of heat into a single mass of a metallic lustre, remains in the state of a dull, dark-grey powder.

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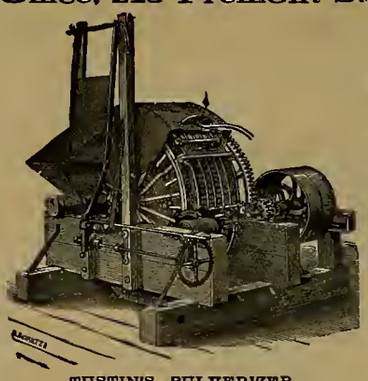

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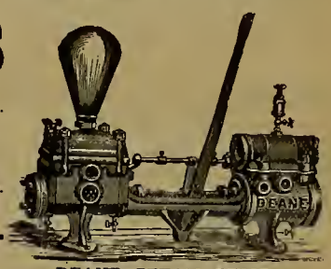

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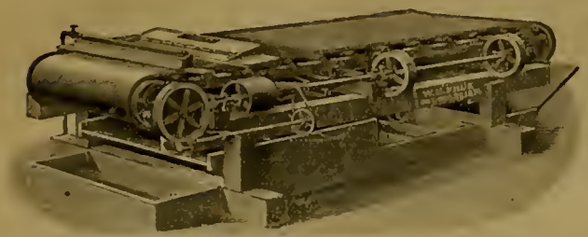
FRUE ORE CONCENTRATOR

OVER 3200 IN ACTUAL USE.

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; and March 31, 1891.



Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
" " " Improved Belt Frue Vanner ..... 800, f. o. b.
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GLADSTONE MINING COMPANY, C. J. Clark, M. E. Gen'l. Supt. FRENCH GULCH, Calaveras Co., Cal., Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to mention. In order to give an idea of the work they are doing here I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

For any information, or for pamphlets, or for circulars or testimonials, call on or address us at our office.

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"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

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Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

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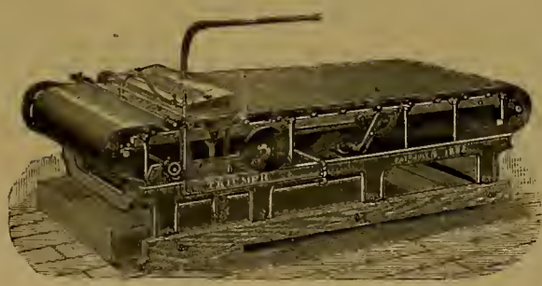

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(PATENTED.)

Both the "Trimph" Concentrator and "Blaedel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,

Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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WATER POWER PLANTS UNDER HEADS AS LOW AS THREE FEET—UP TO THE HIGHEST HEAD OBTAINABLE,

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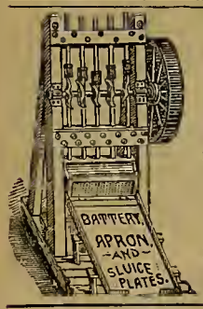

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PRICES GREATLY REDUCED ONLY REFINED SILVER AND BEST COPPER USED. OVER 3000 ORDERS FILLED. FIFTEEN MEDALS AWARDED. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated. These Plates can also be purchased of **JOHN TAYLOR & CO., Corner First and Missien Streets, San Francisco.**

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USEFUL INFORMATION.

SOAP PRODUCTS.—A degree of superiority has long been claimed for some of their specialties in soap products by German manufacturers, and especially in the processes of coloriog. This latter, however, depends largely for its success or attractiveness on the materials used, these being mainly lard, tallow, cocoanut oil, palm oil, and to some extent, almond oil. The method of insuring a satisfactory color is thus a matter of discrimination—heavy, earthy or metallic colors, such as umber or vermillion, being added only when the soap has acquired a thick consistency, while dissolved colors may be added when the soap is still thin. Very few colors only can be made use of before all the lye has been run in and saponification begun, and aniline colors almost disappear at first under the action of the alkali, but return after cooling. The beautiful marbling effects produced is the result of simply stirring up the required color in melted cocoanut oil, runnning it into a funnel closed at the lower end by a finger, and allowing the contents to run over the soap as it is run in layers into the frame, and, on the frame being full, a stick is drawn in fancy figures through the soap to distribute the color. As compared with foreign countries, German manufacturers produce a much larger proportion of their toilet soaps by the color process.

ANTIDOTE FOR ELECTRIC SHOCK.—Is it too much to expect that the medical fraternity will discover an efficacious antidote for electric shock? Many unusual features are presented in cases of this description, but nearly all possess in common the evidences of unconsciousness or apparently suspended animation. It has been the custom of electrical workmen to immediately lay on the ground a person who has been shocked. The idea seems to be that the body is a sort of storage battery, and that contact with the earth effects a ground and discharge. The more probable theory is that the fresh air revives the patient. In shocks of a serious or fatal nature, it has been shown that the blood corpuscles of the victim have undergone an organic change. Can this be corrected and the blood normalized by the injection of a drug? An amateur investigator is reported to have found that the insertion of aromatic spirits of ammonia into the body of a bird which had received a shock brought the animal back to life after all signs of animation had disappeared. The question affords an interresting field for experimentation and it might bring fame to the physician who will devote his time and talents to a scientific investigation of it.—Electrical Review.

LACE HOLES IN LEATHER.—In reference to the tearing out of lace holes in leather belting, Messrs. Fayerweather & Ladew, of this city, say in their little treatise on machine belting, the more thoroughly stretched the band the more liable will it be to be complained of in this respect; not that stretching, properly done, *i. e.*, wet stretching, injures the fibre of the band, but that too much allowance is made for stretch in cutting off the proper length, or, in fact, the hand is made too short. If it is then put upon the pulleys it must be strained to its utmost tension in order to make the ends come together; when laced, the strain upon it will be of itself almost sufficient to break out the lace holes. When the machine is set in motion, the extra strain is more than the band will hear, and it gives way in its weakest place, the lacing breaks or the holes tear out. Then in all probability the broken end will be cut off on a line with the holes, making the band still shorter; new holes will be punched and the hand strained upon the pulleys to break away again with like result.

SPONGE-PROPAGATING. — The United States Government is considering the advisability of establishing a spooge-propagating station in Florida waters. The Florida sheep's wool sponge is extremely durable and valuable. Sponge-fishing has been carried on to such an extent that the Government finds it necessary to take some step to prevent the destruction of the industry. This industry began about the year 1852. Some 250 vessels, employing nearly 2000 men, are now actively engaged in creating the annual revenue of nearly $1,000,000. Sponges are found in the Atlantic as far north as Jupiter inlet. The industry at St. Mark's, at the head of the Apalachicola, competes sixth in rank with Key West. Most of the output goes to New York, about one-third being exported to Germany, France and Ireland.

MINERAL WOOL.—An industry has been established at Roanoke, Va., for the manufacture of mineral wool, the material for which is obtained almost close to the works. Some of the finer grades, though produced from the hardest rock, are as soft as the finest cotton. This mineral wool is indestructible and odorless. It will not burn, decompose or granulate, but will retain its fibre wherever placed. It is coming into large use as a lining between walls of buildings, thus providing a safeguard against fire, and insurance companies are reducing their rates on buildings so fitted. It is introduced into dry kilns, making them almost fireproof.

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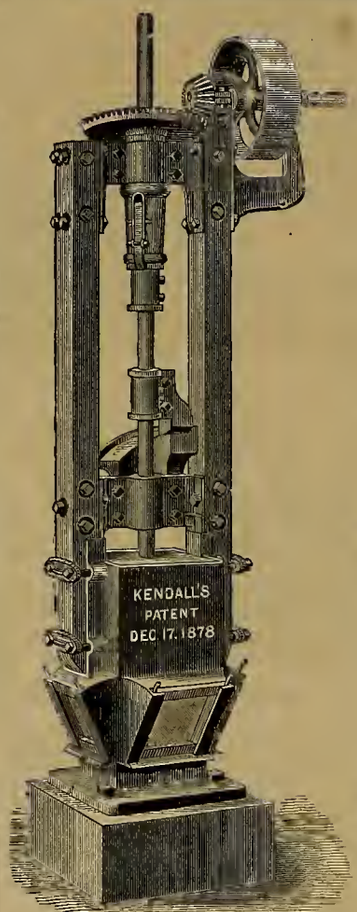

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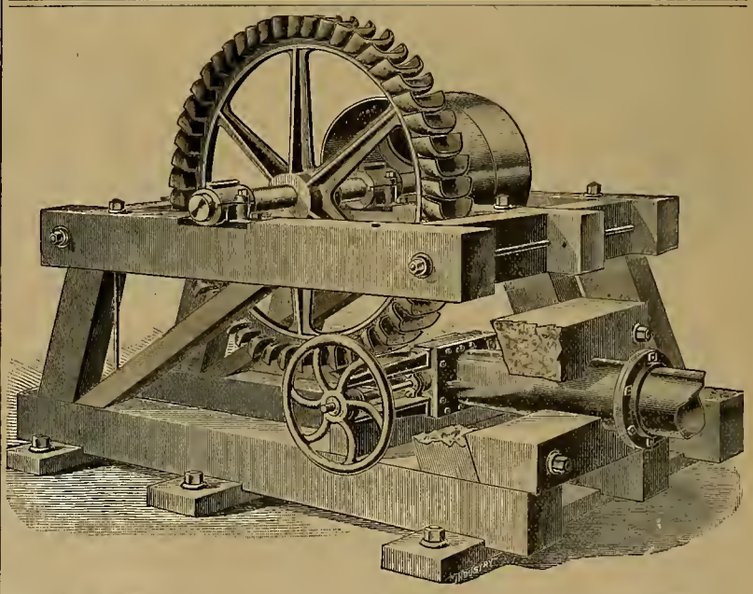

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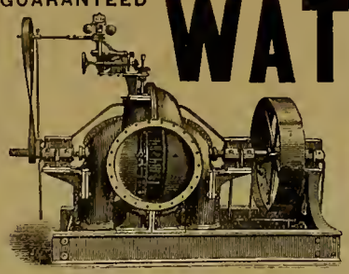
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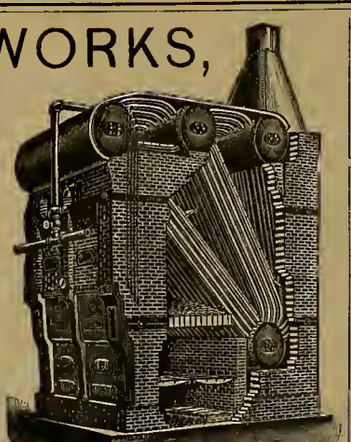

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ELECTRICITY.

The Efficiency of the Lauffen-Frankfort Transmission.

At last, after what appears to us an inexcusably long time, the results of the official measurements of the power transmission from Lauffen to Frankfort, by the three-phase alternating current, have been given to the public. These tests were made as early as October of last year, and it seems strange that it should have taken about seven months to calculate the results. A few bright American students could doubtless have made the calculations in a couple of days at the most. The results are a most excellent showing, and cannot help convincing the most skeptical. The maximum efficiency of 74 and 75 per cent from the turbine shaft to the lamps, 110 miles distant, through three No. 6 wires, is certainly excellent; and as the results are vouched for by Prof. H. F. Weber of Zurich, they can be relied upon as correct. It will be remembered by those who followed the description published in our columns last year that the line was smaller than it was intended to be, owing to the fact that it was a gratuitous loan. The curves show the effect of this small size very decidedly. If the line had been proportioned to suit the plant, the efficiency would have been still better for the larger loads. Another feature in its favor is that the dynamo and transformer, being both built for a greater output, would have had a greater efficiency if they had been run at full load. They were built for 200 kilowatts, or 270 metric h. p., while the largest load in the tests was less than 200 h. p. With the line properly proportioned to suit the rest of the plant, the efficiency would have been higher than 75 per cent, and would not have lowered for larger outputs, as it did in this case. It is, furthermore, not stated in the report what the voltage was, but from a very good authority, who was present at the tests, it appears to have been about 16,000 volts. This, also, is below what was originally intended to be used—namely, 25,000.

With this higher potential, the line losses, which are of course by far the greatest of all the losses, would have been considerably reduced. thus increasing the efficiency still more. Under the conditions for which the plant was originally built, the results would have been astonishingly good; but even under the adverse circumstances, they are excellent, and should convince even the most skeptical. It is to be regretted that more data was not given for the benefit of engineers, showing the results at very small loads, the current and loss in charging the line, the frequency, etc.; but this will doubtless all be forthcoming in the promised detailed report, which we fear, however, will be a long time coming. It can be seen from the curves and figures that the loss in induction and capacity, which some persons predicted would be so great as to make such a transmission prohibitory, are by no means very great. The shape of the curves will show some points regarding this question. As will readily be understood by engineers, the curves worked out by the author of the article show more than the mere figures published by the commission. It may be of interest to note here that as early as our issue of Sept. 5th we published a cable dispatch from private sources stating that the preliminary tests showed an efficiency of about 75 per cent. This is now shown to have been remarkably close to the real value. In our issue of Jan. 9th, we again published another estimate from a private and very reliable and conservative source that the efficiency was probably about 77 per cent. As will be seen now, this was very nearly correct, being still several per cent on the safe side.—Electrical World.

TELEPHONES.—Some interesting statistics have just been published by the Census Department regarding the operation of telephooes in this country, which, according to Supt. Porter, "Show how necessary the telephone service has become in commercial and social affairs, and speak volumes for the enterprise that has attended the development of inventive genius in this branch of the electrical industries." From the tables presented, it appears that in 1880 there were reported 148 companies, firms and persons operating telephone exchanges; in 1890, 53. The total investment in 1890 was $72,341,736, an increase of $57,735,949 in ten years. There was in the same time an increase of $13.306,502 in the gross earnings. and for the corresponding time an increase of $8,770,168 in the gross expenses, making the increase in the net earning $4,536,334! During the same period the number of exchanges increased from 437 to 1241, and the number of miles of wire from 34,305 to 240,412. There was necessarily an increase in the number of employes. In 1890, 8645 persons were employed, while in 1880 there were but 3338. The increase in the number of subscribers was correspondingly large, the returns showing 227,357, as against 48,414 ten years ago. Very few people, even in the electrical fraternity, have any idea of the general use of the telephone. and therefore it may occasion considerable surprise to announce that in 1890, according to the reports filed by the 53 companies engaged in the operation of exchanges, 453.200,000 conversations were carried on by telephone. No better evidence of the dependence of the American people on the telephone can be required.

BLOWING OUT AN ARC.—Central station men have always experienced considerable difficulty, says the *Electrical World*, in blowing out or otherwise interrupting an arc that has once formed across the terminals of a burned-out fuse or between the two poles of a switch on the face of a central station switchboard. The importance of the switchboard as the centre of distribution makes it imperative that this should always be kept in first-class working order. Hence any arc formed at the switches must be promptly interrupted before it has had time to do much, if any, damage. The method of doing this, suggested by Mr. Thomson in his article on "Central Stations," by dashing dry sand against the arc, is one which we think is not very generally practiced in this country. It is doubtless an effective, as it certainly is a cleanly, way of accomplishing what the agile dynamo tender is often compelled to do with more or less disastrous results to his much abused hat. Mr. Thomson also directs attention to a number of other practical points in central station construction and management that are the result of his own experience in this line of work, and for this reason they are especially deserving of careful attention. Many of our readers will take issue with him, however, in the preference which he gives to slow speed engines for all central stations of over 100-h. p. capacity. The continued erection of many plants in all parts of the country with high speed engines, driving dynamo units of from 200 to 300 h. p., may be taken as sufficient evidence that this type of plant has not yet met with disfavor among central station designers.

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MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Butte.

MINING CLAIMS.—Palermo *Progress*, July 9: Bangor is said to be nine miles distant from Palermo, and when you have traveled from 12 to 15 miles you arrive. Here you would find the Bishop mine, which is being worked in a desultory fashion, but profitably. In another direction you would find the old Reyfus mine, where you can see the gold in the sides of the tunnels, speckling the blue cement at beautifully frequent intervals. Hay & Clark are getting ready to work this mine for all it is worth, and are putting several thousands of dollars into machinery for that purpose. Then start out for Oroville, over the Wyandotte road, and just outside of Bangor you will come to the mine which was once known as the Hyland. The present company calle it the Catskill, and every one about Bangor calls it the Marysville. It is down about 150 feet. The mine has a new foreman or superintendent (excuse me) about once in three weeks, on an average, but it is paying satisfactorily and may have a superintendent some day who will satisfy *all* the stockholders. The next mine we strike is Mr. Wheeler's at Wyandotte. This gentlemen is getting out some gold, and thinks his mine is on the same lead as the mines at Bangor, but the gold he gets is of a different kind, and it is probable that he is mistaken. However, he probably does not care so long as the gold is there. Coming to Oroville, we pass over the bridge and turn up the river, passing one of the largest mining enterprises in the State, that of the Golden Feather River Bed Mining Company, under the management of Msjor Frank McLaughlin. Work on this claim has just commenced this season, and the workmen are preparing to put in the auxiliary flume and pumps to drain out the river bed again. Above this, we come to the Golden Gate claim. Of this the only thing we notice is the great head dam, for this claim is not to be worked this year, the intention being to devote all the time to the Golden Feather claim, clean it out and tackle the Golden Gate the following year. The immense water power incidentally developed by the two dams is shortly to be utilized in driving several immense dynamos which will supply electrical power for other places and for working the mine in the river bed. Now, leaving Cherokee behind, and we should approach Paradise. A little ways out and we come to the Mineral Slide claim, which has been abandoned as costing too much to work. But if we should take this journey, we should only have time for a hasty visit to the five or six tunnels of the Magalia Consolidated before putting the horse up for the night. Well, here is the mine, and as they are not cleaning up to-day, Supt. Moody will allow us to visit it in all its branches. The tunnels enter the face of the hill direct, and interlace and communicate one with the other in bewildering fashion, but the most interesting fact of all in connection with the mine is that it is yielding about at the rate of $100 per day to the man.

MINING BOOM.—Oroville *Register*, July 11: Everything indicates a mining boom in Butte which will equal those of pioneer days. The rich gravel mines of Bangor, Magalia, Nimshew, Butte Creek, Gravel Range and other sections have attracted men of capital and energy. These mines are being opened and developed rapidly. On every side new mines are being taken up and prospected. It is thought that a thousand men will be at work within a few miles of Bangor within one year, yet this was one of the abandoned mining camps of the county. Never before was there such eagerness to secure mining ground by men of means. Never before was large capitalists being attracted here in such numbers. A 60-stamp mill will be soon erected at Forbestown; the Stow mine is doubling its stamps and will soon have 40 at work; the Golden Queen will soon be crushing again, while other mines in the neighborhood will ere long be ponring out gold. The Banner is being pushed ahead with 27 men diving deep for gold. The Palo Alto has 35 men getting out rich rock, while encouraging reports are heard from French Creek, Gravel Range and many other places. The stir and hum of mining is heard on every side; men talk of mines and of the golden ore more than ever in the past, and to-day the outlook for rich mines in the county is better than was ever before known.

Los Angeles.

THE AZUSA DISTRICT.—Cor. Los Angeles *Express*, July 2: The present owners of the old Kelsey mine, located about six miles up the canyon, have lately been packing ore down the mountain to the river, and hauling it thence to the railroad at Azusa, whence they ship it to Pueblo, Colo., for smelting. The reason they ship to that place is because of the presence of black sulphites, which cannot be treated successfully nearer home. They have made several shipments, and the returns thus far have been such as nearly to take the breath away from those most interested. One shipment of 17,000 pounds assayed $87,000, ar over $5000 per ton. This mine was discovered about 15 years ago by Lewis Sharp, now of Glendora, who developed it to some extent. It afterward passed into the hands of a syndicate, who held it under bond for some time. They made one or two shipments of ore to San Francisco, the assays of which proved very rich, hnt those who had the management, fearing that rich ore was only a pocket, adopted the policy of trying to sell out before the vein was exhausted, and since that time the mine has been kept closed to the public and an air of mystery thrown around it, until people became convinced that there was no well-defined vein of paying ore there. Lately, however, the owners, a company of New York capitalists, have begun development in earnest, with most gratifying results. The richness of the ores already shipped will undoubtedly make the future development of the mine assured, and it will also induce the owners of other mines and claims in that district to develop their properties. One advantage of the district is its nearness to railroad transportation. Within six miles are the tracks of the Santa Fe road, which avoids a long haul over the mountains, and supplies can be cheaply had. It will readily be seen that the future of Azusa is full of promise.

Humboldt.

WILLOW CREAK.—Blue Lake *Advocate*, July 5: Mining matters in the Willow creek and the Three creek sections are decidedly on the improve. Messrs. Kirk & Sinclair have located on a claim above the Golden Dawn. H. S. Soule has sold a half interest in his mine to S. T. Waller. The Moore claim has been sold to San Francisco parties, and the manager is here with both supplies and tools. This claim is situated between the Curran and the Samuel Bagley mines. Work is in progress on the Soule claim and also on the Getchell & Little claim. John Haney of the well-known Deerlick claim, after four days' work in his high bar, has a fine showing. Operations have begun on the Kelly and the Curran claims. It is reported that the machinery for Thomas Knight's mill on Three creeks is on the way. The Three creek mining section has been located from the source of that stream to the month. The Three creek mine, the Marion C, the Ethel, the Lodestar, the Enterprise and the Grandpa are among the mines that have been located on Three creeks. D. A. Wright of Acorn will commence operations on the Cora next week.

Nevada.

A GOOD CLEAN-UP.—Grass Valley *Telegraph*, July 7: A crushing recently made from the Norambagna mine yielded very well. There were 20 loads of ore taken from the upper tunnel of the mine by Faucett & Thompson, and it yielded 39 ounces of gold or about $31 per load. The ore was crushed at the Joe Southern mill.

SUPERINTENNENT RESIGNED.—L. P. Goldstone has resigned his position as superintendent of the Champion mine at Nevada City. Mr. Goldstone has done this in order to better his condition.

Siskiyou.

ON THE KLAMATH.—Yreka *Journal*, July 6: German, Courtney & Co., opening a claim in the Klamath above mouth of Shasta river, will no doubt take out a great amount of dust this season. They have 14 hands employed, and will soon commence bottoming their claim in channel, being now close to bedrock. In a little corner of the claim where bedrock was reached last week, they have realized about $50 a day, with only two buckets in use. At the old Capt. Pope garden, a company is gradnally sinking down to bedrock in channel, and expect to realize a rich haul of gold-dust, as the river is supposed to be rich in mineral deposits at that point. A couple of Oregon companies farther up the Klamath are also sinking down cuts to bedrock, with big expectations. This portion of the Klamath above mouth of Shasta river to Cottonwood or Hornbrook has not been worked since the '50 period, until the completion of railroad, and is undoubtedly very rich. In the Cottonwood creek vicinity, it is said that as high as $2000 was realized from a single pan of bedrock skimming in 1855.

Trinity.

NEW RIVER.—Cor. Trinity *Journal*, July 2: The many friends and acquaintances of Clement & Ladd of Boomer Mine will be glad to learn that said mine is paying quite a dividend this summer. The Excelsior Mill is busy at present crushing about 40 tons of ore, which is supposed by Mr. Colgrove, the superintendent, to realize $30 to $40 per ton. Leas and Nicholson of the Sherwood Mine have several men employed in taking out ore. They have about 60 tons ready to mill directly. Miller & Stone of the same mine have just crushed about 75 tons in their own mill. We have not learned the amount of the proceeds, but we are confident the returns are good. Fulmore & Miller, Jr., are busy at work in the same mine. They have not taken out any ore that we know of, but they expect to strike the ledge they are in pursuit of any day.

BIG BAR.—Blue Lake *Advocate*, July 5: Geo. W. Tinsley of Big Bar, Trinity county, was in Blue Lake last Sunday. Mr. Tinsley informs us that the Keely mine on Trinity river changed hands recently. Mrs. Keely sold it to a company of Chinamen. This mine is turning out some fine ore, and lately a big chunk valued at $47 was found. About 60 men are employed in that mine. The Taylor Flat mine, eight miles from Big Bar, of which Capt. Griffiths of San Francisco is the owner, is running industriously night and day with a crew of 15 men. About eight placer mines are now in active operation around Big Bar, and that village is enjoying lively times.

TRINITY CENTER.—Cor. *Journal*, July 9: John Critchlow hauled a 50-horse power steam engine into the Cinnabar mines last week for the McCaw Bros., and will haul the boiler in this week. H. L. Lowden passed through here yesterpay morning on his way to do some surveying at the Cinnabar mines, and, judging from present indications, one of the largest quicksilver mines in the world will be opened up at that place within a few months. Messrs. Hutchine and Allen are prospecting in the neighborhood of the Center. W. C. Watson, of San Francisco, and Roland Raines, of Igo, are prospecting near the headwaters of Coffee creek. R. D. Lawrence and J. Peters of Mendocino county, are prospecting on the South Fork of Coffee creek. C. Osborne and J. Trimbath, of Deadwood, have been prospecting on Snow gulch, but have started up Coffee creek. Dan Kitchen of Deadwood is prospecting on Copper creek, near Carrville. H. H. Dangherty and E. Edmundson of this place have been prospecting in the neighborhood of the North Fork of Coffee creek, and also on the headwaters of Clear creek. They have taken a prospecting trip to Six Mile creek, in company with C. M. Root of San Bernardino county. The quartz mine, owned by Strode & Bouder on Hostetter Gulch, near Carrville, continues to develop steadily under the work that is being done on it, and has proved to be a good property. Both men are below at present, negotiating for the purchase of a water wheel and additional machinery, and will put up a cannon-ball mill on their return.

Tuolumne.

ON JACKASS HILL.—Stockton *Mail*, July 7: A. O. Viertoug came down yesterday with his wife from Jackass Hill, Tuolumne county. Mr. Viertong has three fine mines on the hill with the unpolished name, and he confidently hopes that they will make him a millionaire. They are called the King Solomon's Ophir, John Donkey (polite for Jackass) and the Coarse Gold. The ledges are large and seem inexhaustible. The ore is very rich. The mines were discovered by Mrs. Viertong herself with her husband's indicators, and on ground that has been prospected a hundred times. Mr. Viertong told the old prospectors jocularly that they left the ledges for him.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Chronicle*, July 9: There has been extracted from all parts of the mine during the week 850 130-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $25.11 per ton. The average assay value of all the ore worked at that mill during the week, 840 tons, was $22.60 per ton, per battery samples. Bullion shipped to Carson Mint, assay value, $25,867.44.

OPHIR.—1465 Level—The drift running south 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, has been extended during the week 12 feet; total length, 159 feet, continuing in a mixed formation of porphyry, clay and some quartz.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, at a point 40 feet east from the winze, has been advanced 13 feet; total length 133 feet; in porphyry and clay.

SIERRA NEVADA.—The east crosscut No. 1 from the north drift, 100 feet in Kenosha tunnel, has been advanced 30 feet, making its total distance 106 feet; face in porphyry and streaks of quartz.

ANNES.—On 420 level have retimbered a portion of north drift on east side of the ledge, and advanced the same 6 feet; face in quartz.

GOULD & CURRY.—The joint upraise with the Savage Co. from the Sutro tunnel level has been carried up 20 feet; total height 150 feet; face in porphyry and stringers of quartz. The joint winze from Savage, 1500 level, is now down 36 feet; face in porphyry and quartz. There is considerable water in the bottom that impedes rapid progress.

BEST & BELCHER.—North drift from east crosscut No. 1 has been advanced 18 feet through porphyry, seams of clay and stringers of quartz; total length 38 feet.

HALE & NORCROSS.—Main incline—We have cleaned out and repaired the main incline a distance of 25 feet during the past week, making its total depth 160 feet below the 1700 level. To-day we began the work of opening the station on the 1800 level in the incline. The bullion yield of the mine for the month of June was $19,810.53.

CHOLLAR.—Are reparing on the 650 and 750 levels. The east crosscut near the north line, 939 level, is in 50 feet; face in soft porphyry and clay.

POTOSI.—East crosscut from south drift from Potosi winze, 1150 level, is in 35 feet; face in low-grade quartz. North winze, 60 feet north of the Potosi winze connection, 1200 level, is in fair-grade ore. South drift from bottom of south winze, 1200 level, is in 35 feet; face shows 4 feet of $20 ore. Have started a drift north from top of raise on 1300 level, which is following 4 feet of quartz assaying $20. This drift will connect with the bottom of the north winze from the 1300 level. The joint Bullion winze is down 440 feet below the 1500 level; bottom in low-grade quartz. Extracted and sent to the mill in the past week 386¾ tons of ore from the 930, 1000, 1100, 1150 and 1200 levels. Milled during the week 381 tons. On hand at mill 81 tons; average battery assay $22.99; average car sample assays $22.93.

BULLION.—The joint Potosi winze is down 440 feet below the 1500 level; hnttom in low-grade quartz. Have started an east crosscut 560 feet south of north line, 1500 level, which is in 18 feet; face in quartz and clay. The joint northwest drift from the 1800 level of the Ward shaft, has a total length of 575 feet; face in porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels have extracted and milled 180 tone of ore of the average value of $24.20 per ton, as per car samples. Milled 150 tons; battery samples $22.40. Have resumed the proposed work on the 750 level and are driving No. 4 crosscut farther west from the main north drift. We have started an east crosscut from the Zadig drift from the Sutro tunnel, at a point 700 feet south of the main tunnel.

CON. NEW YORK.—The winze in No. 4 west crosscut, 650 level, is down on the slope 30 feet; the bottom shows an 18-inch streak of fair-grade ore. The west crosscut, 850 level, is in 31 feet; face in porphyry.

Ferguson District.

GOLD QUARTZ.—Pioche *Record*, July 2: W. J. Dooley returned from Ferguson district Sunday, bringing with him a 25 pound specimen of gold quartz from the April Fool mine. The whole piece averages a dollar a pound, and was shot out about four feet from the bottom of the shaft, where the ledge looks exceedingly well.

ARIZONA.

A PROMISING GOLD MINE.—*Silver Belt*, July 7: As the product of ten tons of ore worked in the Centennial mill, R. E. Humphrey has a 13-pound bar of bullion, and which, according to his test, shows the ore to go upward of $100 per ton in gold and silver, the gold very largely predominating. From another source, the value of the ore is given at $40 to $45 per ton, mostly gold. Accepting the latter estimate as correct, it sustains Mr. Humphrey's opinion that the ore carries gold and silver in paying quantities, which has been opposed and even scouted by many who are supposed to be good judges of ore. The assay value of the ore, taken in connection with the reported size of the vein, makes it one of the biggest mining propositions in the United States. The ledge is reported by Mr. Humphrey to be some 1500 feet wide, and from the bottom of the shaft, 34 feet, where the ore was taken for the test run, he has drifted between 60 and 70 feet, being in ore the entire distance. There are 75 tons of good ore on the dump, and it is claimed that ore can be mined in quantity sufficient to keep two or three mills running. A force of 12 men has been put on to develop the property.

BRITISH COLUMBIA.

A GREAT MINING FIELD.—Kamloops *Sentinel*, July 3: The discoveries which have lately been made in the valley of the North Thompson demonstrate that the valley of this river and its tributaries is a most promising mineral region, and one which to the present time remains almost entirely unexplored. The reasons for this belief are that the principal streams forming this river take their rise in the same district as do the waters of the Quesnelle and other large gold-carrying creeks and rivers which have made Fraser river and Cariboo famous for the last 30 years. The waters of the Thompson cut through the slaty rocks which carry the Cariboo gold, and also the limestone and other formations which furnish the argentiferous minerals of the Kootenay districts. Gold has been found in the quartz at Jameson creek, which is about 17 miles from Kamloops, and it also exists on the east bank of the North Thompson, near Lewis creek. Quartz rich in silver has been discovered near the junction of the Clearwater river with the North Thompson, about 75 miles from Kamloops. Mineral is known to exist in large quantities at Mahood lake, whose outlet is into the Clearwater. At Tum Tum lake, southeasterly from the upper valley of the North Thompson, very rich argentiferous ore was found many years ago. The sources of this lake reach easterly up to the summit of the Gold range, on the opposite or eastern side of which is Smith creek, where gold is now successfully mined. Tum Tum lake finds an outlet southerly into Adam's lake, a beautiful sheet of water, on the shores of which fine samples of galena or silver-lead ore have been found. There are no mining locations yet made in this extensive region, which is nearly 200 miles long and about 100 miles broad, reaching to the borders of Cariboo on the north-northwest and to Big Bend on the east, except a few which have been recently taken up.

OREGON.

CRACKER CREEK.—*Bedrock Democrat*, July 4: After years of waiting and futile experimenting in the reduction and treatment of the ores of the E. & E. mines at Cracker creek, the problem has been solved, and at last there is a certainty that hereafter these great mines will be successfully operated, and in a manner that will bring about an advanced movement in the mining districts southwest of Baker City—a change that has been anxiously anticipated several years. The *Democrat* is reliably informed that the work now being done by the Powder River Milling Co. at the E. & E. mine under the supervision of Mr. E. P. Cowen is highly satisfactory. Five stamps are running, reducing about 12 tons of ore per day of 24 hours, wet crushing, double discharge, 40 mesh, and the pulp is passed over three Luhrig vanners, which save between 75 and 80 per cent sulphurets contained in the ore, and making concentrates that assay from $150 to $300 gold per ton. It is understood that the result thus obtained is above the company's contract price with the Vanner Co., and that therefore 15 new vanners have been ordered and will be placed in the mill so soon as they can be gotten here from New York. With these in position, every one of the 20 stamps in the mill will be dropped, and 60 tons of ore per day will be put through. The Luhrig vanner solves the problem of working E. & E. ores, and the concentrates from these machines may be either shipped or treated by chlorination on the ground. We believe the E. & E. has blown its whistle for a long and most successful run, and that that whistle is the clarion presaging the dawn of a new era for base ore mining in Eastern Oregon.

SOUTH DAKOTA.

A SPLENDID BRICK.—Deadwood *Pioneer*, July 3: One of the cleanest and prettiest gold bricks ever seed in the city was brought up from the Golden Reward chlorination works last evening and deposited in the vault of the Deadwood National bank. It was the cleanup for the last 15 days in June, and weighed 1254 ounces, worth $23,199. This is about $6000 more than the usual product in the same length of time, and the increase was due to the large amount of ore out through. It is thought that the output can be kept up to this standard from now on.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 14, 1892.

Geoeral trade for the week under review has been fairly active, with a marked increase in the volume of goods gone out on orders. The call has been from coast ports, agricultural districts and mining centers. It is claimed that the buying, except for distant points, was confined largely to assortments, and that stock-purchasing will not he done until fall goods are received and opened out. The opinion gains ground that labor troubles at the East will throw considerable of the work that has gone East to iron workers on this coast. Whether this will prove to he the case remains to he seen, yet it must he admitted that, with a strong, determined fight at the East between millmen and employes, this coast will he in good position to reap a decided advantage, provided the raw material does not cost proportionately too much. Pittshurg mail advices report that the decline in pig iron at that point has, since February, 1892, heen as follows: Bessemer $1.75 per ton, Gray Forge 90c@$1, and No. 1 Foundry $1.15. Whether the present labor troubles in Pennsylvania will extend to the Western mills is, as yet an open question, hut it is claimed that while some are liahle to be affected, the majority will not he, owing to their having nonunion men. The local money market is easy. Collections the past week are said to have heen made closer than for several months past. The reserve fund in the hanks is said to he quite large, with a light call still ruling. Those in a position to know say that there will he a large demand for accommodations on grain in the warehouses, for farmers will store more freely than for several years past, unless prices for wheat should advance in the near future. This will naturally tie up large sums of money until farmers tire of holding and sell. Eastern mail advices report large dishursements of funds on accrued interest and dividends.

SILVER—The market advanced slightly early in the week, only to fall hack again owing to a prevailing opinion at the East, and also ahroad, that the Stewart silver hill would not he acted on by the House at this session of Congress. This opinion appears to he well grounded, for the House, on yesterday, refused to take up the hill for immediate actioo, which places it on the calendar. It is not likely to he reached this session. This action, it is hardly necessary to say, disappoints the friends of himetallism. What will he the outcome it is hard to say, hut it may prove a hoomerang to those who have operated oo the hear side of the market. It is a well established fact that a strong moneyed syndicate has heen operating in the metal, and, if there is a large short interest out, we may yet witness a rapid advance and high prices before the end of the year. If the move is only made to make the shorts fill, then the market will hardly remain up, hut fall hack again as soon as the object sought is accomplished.

Exports of silver hullion the past week aggregate as follows; To Japan, $52,200; Calcutta, $52,500.

MEXICAN DOLLARS—The market is quiet hut steady at 69@69¼. Exports hy sea the past week aggregate as follows: Hongkong, $238,768; Japan, $30,000.

QUICKSILVER—Receipts the past week aggregate 566 flasks. The market has ruled steady at current quotations.

BORAX—Receipts the past week aggrgate 1195 centals. Owing to low outward freighis hy sail to New York the exports are largely hy sea. The market is steady.

LIME—Receipts the past week aggregate 2318 hhls. The demand is quiet at around $1.40@$1.50.

ANTIMONY—The call is only fair. New York mail advices quote as follows: 11c for Haslett's, 12c for LX and 14c for Cookson's, in wholesale quantities.

PIG LEAD—The market has a strong tone in sympathy with the East, where strong holding and a good demand have strengthened prices.

TIN—Imports the past week aggregate 2288 iogots from Australia. Plate is fairly steady. The consumption is larger than was expected, hut heavy stocks keep prices from moving up. Pig is firm under a stroog holding. New York mail advices report pig as follows: "Some transfer of speculative holdings has taken place, hut the change alters the position of supplies in no important degree and new ventures are engaged in very cautiously. As a matter of fact, speculation has heen confined chiefly to the evening up of old deals, and purchases hy jobhers and consumers are limited as closely as possible to clearly defined wants. Futures are still at a discount in London.

MANUFACTURED IRON—The market is strong, with an advancing tendency in sympathy with higher prices at the East. The advance East is due to labor trouhle.

PIG IRON.—The market continues to rule in huyer's favor. Low markets, with the tendency still downward, at the East are against holders in this city. The European markets are reported barely steady at the recent decline.

COPPER.—London cahles to *Iron Age* report as follows: "Prices have averaged somewhat lower, hut concessions failed to attract huyers, and the market is rather dull. Chili charters last month were 1600 tons. Late sales of furnace material include 600 tons Montana argentiferous matte on private terms, and 500 tons do. at 9s 4½d. Imports of copper last six months 4867 tons, and the deliveries 1149 tons less than during the corresponding period last year." New York mail advices report that some disagreement as to the selling of Anaconda and Montana product is having more or less unfavorable effect upon the market for the same and indirectly upon values of Lake product. The nature of the misunderstanding is not made public, however, and whether it will lead to a rupture in the agreement to regulate production and exports, is problematical.

COAL.—Imports the past week aggregate 20,372 tons, distrihuted as follows: Nanaimo 4081, Newcastle, N. S. W., 6793, Swaosea, 6229, Cardiff, 701, New York, 443, Baltimore, 2125. The market is harely steady, notwithstanding an increasing consumption of steam reported. The stock here is lessening, hut the quantity on the way is large. Larger quantities are looked for from the coast collieries.

COKE.—Imports aggregate 1601 tons. The market is reported in huyer's favor.

Mining Share Market.

SAN FRANCISCO, July 14, 1892.

While the market for shares of the North End group of mines was firm throughout the past week, with higher prices toward the close, the shares of the Gold Hill group were weak at lower prices. Whether the shares of the two groups of mines are heing manipulated hy different stock pools is, as yet, an unsolved problem, although the action of the market justifies the helief that they are not heing maoipulated hy the same persons. It has heen many years since the several groups of mines were controlled and the shares manipulated hy different pools, hut when they were we had active and more prosperous times; now everything is lifeless—more dead than alive. It looks as if the causes for the erratic movements in the share market will he solved soon, for with Alvinza Hayward, D. O. Mills and J. L. Flood here, J. W. Mackay to arrive in this month and Francis G. Newlands and Senator J. P. Jones to arrive in next month, this mystery will, soon after they meet, he cleared away. With their conferring and all is found to he harmonious, then the share market will go to pieces, hut if they disagree and a fight for spoils takes place, a more aetive market and higher prices can he looked for. If this view is correct, then a conservative course, we think, would he the part of wisdom for outsiders to pursue until the probahle future policy of the rings is more clearly revealed. To sell the market short at present prices is dangerous, for if everything in sight is made, it hardly justifies the risk run, and to go long on the market then assessments, it is more than likely, will have to he paid and desperate chances taken of not heing ahle to sell io the near future at a sufficient profit to justify the venture. The last proposition is not hased on the condition of the mines, for they were never hefore in hetter working condition, hut it is made on the well-recognized fact that the mill rings, so far as their puhlic acts go to show, have not experienced a change of heart, and uotil they do it will continue assessments for outside shareholders and hullion for the rings. It will require the turning of the mills over to the mines to disahuse the puhlic of the well-grounded opinion that the mines are not honestly worked and the ore not milled in the interest of *all* shareholders. The developments in the Hale & Norcross suit were an eye opener.

It is difficult to get private and reliahle advices from the Comstock mines. This is undouhtedly due to a helief on the part of miners and others that a man who either divulges what is in the mioes or stands otherwise in the way of those in power is quietly "shelved" or made way with, accidentally of course, so that no tales can he told again. While this may have heen the case years ago, we hardly think it would he policy for those in power to pursue such a course now. Perhaps it may yet take the disclosing of some of the dark and hidden secrets of the Comstock to teach a lesson that will never he forgoiten, and at the same time prove the fallacy of the saying that dead men caonot tell tales.

S. White Jr., Chairman of the Committee on Mining Securities of the New York Consolidated Stock and Petroleum Exchange, is authority for the statement that a conference of the various mioing exchanges of the country will take place in September under the auspices of the Consolidated Exchange in the Exchange's huilding, in New York City. The object of this conference will he to agree upon some plan or plans which shall prove heneficial to all the mining exchanges in the United States. Who knows hut this may he the inauguration of a new era in the mining industry on this coast, particularly so since actual tests of two or more improved methods of milling low-grade and also refractory ores have resulted so favorahly.

The failure of the lower house of Congress to advance the Stewart Silver hill is used as a haodle hy the stock pools to get in more shares. The fact must not he lost sight of that the ore whlch is extracted on the Comstock is runniog more to gold. A few years ago the larger percentage was silver; now it is heing reversed. This change is fully set forth hy the monthly statemeots of the hullion outturn of the Con. Virginia Mioing Co.

Well-informed and at the the same time conservative persons, look with considerahle confidence to the work that is heing pushed in Belcher, Hale & Norcross, Con. Virginia and two or three other mines. In the two first-named mines, the work is of such a character as to eocourage the helief that important strikes are liahle to he made aoy day. It is rumored on the street that J. W. Mackay has heen telegraphed to return to the coast and inspect a strike in one of the mines that he and J. L. Flood are claimed to control. If there has heen such a strike, the superintendent of the mine in which it was made, failed to report it in his weekly letters, hut this is no uoosual thing, if reports are to he relied oo, for superintendents to do. The hattery assays of the ore milled hy Belcher and Crown Point are over $30 a ton, hut the quantity of ore was small. If the managers desired, it is claimed, a very large increase in the number of tons of ore extracted could have heen made and contioued for weeks to come.

From the outside the news grows in interest. It is claimed that dividends will he paid hy one or more companies.

"IT is becoming harder to sell electrical goods every day," mused an electric light salesmao. "A few years ago, the general public knew nothing of electricity and didn't pretend to. Then all I had to watch were the prices I submitted, as the buyer was apt to take the cheapest machine, irrespective of its merits. Nowadays, everybody knows a great deal of electricity, or thinks he does, which is worse, and I have to watch my prices and disabuse his mind of fallacious ideas at the same time.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alta S M Co, Nevada	42	15c	June 18, July 26, Aug 16		L Osborn, 309 Montgomery
Belle Isle M Co, Nevada	14	10c	June 16, July 21, Aug 12		J W Pew, 310 Pine
Bodie Cons M Co, California	14	25	June 20, July 22, Aug 22		H D Walker, 309 Montgomery
Bullion M Co, Nevada	38	25c	May 24, June 28, July 19		R. R. Grayson, 331 Pine
Butte King M Co, Nevada	8	5c	June 4, July 11, Aug 2		W C Lewis, 723 Market
Chollar M Co, Nevada	33	50c	May 28, June 7, July 27		C E Elliott, 309 Montgomery
Commonwealth Cons M Co, Nevada	8	10c	June 15, July 21, Aug 18		R E Grayson, 331 Pine
Con St, Gothard M Co, California	5	5c	June 9, July 14, Aug 4		T Wetzel, 320 Sansome
Cons New York M Co, Nevada	8	10c	June 28, Aug 2, Aug 23		C E Elliott, 309 Montgomery
Evening Star M Co, California	4	2½c	June 7, July 12, July 29		J J Scoville, 320 Sansome
Fall River Con M Co, California	8	3c	May 27, July 2, July 27		A Lorsbach, 409 Clay
Gould & Curry M Co, Nevada	68	52c	June 7, July 12, Aug 4		A K Durbrow, 309 Montgomery
Gray Eagle M Co, California	29	5c	July 6, Aug 9, Aug 13		A W Barrows, 303 California
Mexican Phosphate and Sulphur Co	1	10c	June 8, July 18, Aug 8		A Halsey, 328 Montgomery
Ophir M Co, Nevada	58	50c	June 3, July 7, July 27		E B Holmes, 309 Montgomery
Peerless M Co, Arizona	18	5c	July 6, Aug 11, Sept 7		A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	5c	July 11, Aug 14, Sept 12		G R Spinney, 310 Pine
Sierra Nevada M Co, Nevada	102	25c	June 10, July 13, Aug 2		E L Parker, 309 Montgomery
Summit M Co, California	12	5	June 27, July 19		M E Welles, 309 Montgomery
Terikoff G M & M Co, California	3	1c	May 31, July 6, July 29		W J Gurnett, 308 Pine
Utah Cou M Co, Nevada	15	25c	June 7, July 11, July 29		A H Fish, 309 Montgomery
Yellow Jacket M Co, Nevada	51	25c	May 9, June 14, July 18		W H Blanvelt, Gold Hill

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Benton Cons M Co, California	Annual	W B Allen, 319 Pine	July 27
Dora G M Co, California	Annual	C Colman, 309 Montgomery	July 27
Lady Washinton Cons M Co, Nevada	Annual	L Osborn, 309 Montgomery	July 27
Live Oak Drift Gravel M Co, California	Annual	E Cheminant, 313 Montgomery	July 30
Riverside M Co, California	Annual	J Stadfeld, 309 Montgomery	July 26
Savage M Co, Nevada	Annual	E B Holmes, 309 Montgomery	July 21
Union Cons M Co, Nevada	Annual	A W Barrows, 303 California	July 18
Yellow Jacket M Co, Nevada	Annual	W H Blanvelt, Gold Hill	July 18

LATEST DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	July 18
Con Cal & Virginia M Co., Nevada	50	W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	July 11
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 22.		WEEK ENDING June 29.		WEEK ENDING July 3.		WEEK ENDING July 13.	
Alpha	.20	....	.15	.20	.20	.30	.20	.25
Alta	.15	.30	.15	.20	.15	.20	.20	.25
Andes	.35	.40	.30	.35	.40	.45	.40	.45
Belcher	.60	*1.20	1.05	1.20	1.25	1.95	1.25	1.65
Belle Isle	....	....	.05	....	.05	....	.05	....
Best & Belcher	1.75	1.95	1.50	1.55	1.65	1.95	1.80	1.90
Bullion	.30	.40	.30	*.55	.50	.65	.50	.55
Bodie Con	.15	.20	.10	.15	.15	....	.20	....
Bulwer	.40	.45	....	....	....	....	.45	....
Commonwealth	....	....	.05	....	....	....	....	....
Con. Va. & Cal	3.60	3.85	3.20	3.55	3.35	3.85	3.50	3.90
Challenge	.40	*.45	.40	....	.50	.65	.50	.60
Chollar	.25	.35	.20	* 70	.75	.85	.65	.80
Confidence	....	....	1.25	....	....	....	1.80	....
Con. Imperial	....	....	.05	....	.05	....	.05	....
Caledonia	.20	....	.15	.25	.20	.30	.25	....
Crown Point	.75	.90	.70	.85	.80	1.25	.90	1.15
Crocker	....	....	....	....	....	....	....	....
Del Monte	....	....	....	....	....	....	.05	....
Eureka Con	....	....	....	....	....	....	2.25	....
Exchequer	.10	.16	.10	....	.15	....	.15	....
Grand Prize	.10	....	....	....	....	....	....	....
Gould & Curry	.75	.85	.55	.70	.70	.95	.85	*1.10
Hale & Norcross	1.10	1.45	1.25	1.40	1.35	1.50	1.30	1.40
Julia	....	....	....	....	.05	....	.15	....
Justice	.15	....	....	....	.15	.20	.15	....
Kentuck	.10	....	.10	....	.15	....	.10	.15
Lady Wash	....	....	....	....	....	....	.10	....
Mono	.30	.35	....	....	.35	....	.40	.45
Mexican	1.40	1.55	1.25	1.40	1.40	1.70	1.55	1.70
Navajo	.05	....	.05	....	....	....	....	....
North Belle Isle	....	....	.10	.15	....	....	.05	....
New Queen	....	.50	.45	.50	.45	.60	.30	.45
Occidental	.35	....	.30	.35	.30	.40	.35	....
Ophir	1.80	2.25	1.35	1.80	1.50	*2.60	2.35	2.80
Overman	.30	*.60	.50	.60	.60	.75	.60	.70
Potosi	.40	.50	.50	.55	.55	.70	.45	.70
Peerless	....	....	....	....	....	....	....	....
Per	.05	....	.10	....	.05	....	.05	....
Savage	1.40	1.65	1.35	1.45	1.40	1.60	1.30	1.55
S. B. & M	.20	.30	.25	....	.25	.35	.30	.35
Sierra Nevada	.80	.85	.60	.80	.75	1.00	.90	*1.20
Silver Hill	.05	....	.05	....	.05	....	....	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.80	1.00	.70	.90	.75	1.25	.95	1.10
Utah	.10	....	.05	....	.05	.10	.05	*.35
Yellow Jacket	.75	.90	.75	.85	.85	1.00	.80	1.00

*Assessment added.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 15	English, lb	— @ 18
BORAX.		Canton tool	— @ 8¼
Refined, in car lots	— @ 7½	B'k'r Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	6½@ 10
Concentrat'd, do	— @ 6¾	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE.**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 00
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 8 00
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 5 00
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @12 60
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot ₩ lb	— @ 24
Norway, base	— @ 4½	**COAL.**	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton ₩ ton	22 00@— —	Wellington	$8 00
Glengarnock	23 00@— —	Gretna	6 75
Am. Soft, No. 1	24 00@— —	Nanaimo	7 00
Oregon Pig	—@— —	Gilman	6 00
Puget Sound	—@— —	Seattle	6 50
Clay Lane White	24 00@— —	Coos Bay	5 50
Langloan	22 00@— —	Cannel	8 50
Thorncliffe	23 00@— —	Egg, hard	11 50
Gartsherrie	22 00@— —	Cumberland, in sacks	14 00
Barrow	22 00@— —	Do, bulk	13 00
Cargofleet	22 00@— —	Wallsend	7 00
CHROME IRON ORE.		Scotch Splint	7 00
Per ton	10 00 @— —	Brymbo	6 75
LEAD.		West Hartley	7 50
Pig	— @ 4½	TO LOAN—PER TON.	
Bar	— @ 5½	Australian	5 75@— —
Sheet	— @ 7	Liverpool Steam	6 00@— —
Pipe	— @ 6½	Scotch Splint	6 00@— —
SHOT.		Cardiff	6 25@— —
(Discount 10% on 600 bags.)		Lehigh Lump	12 00@— —
Drop, ₩ bag	1 35 @ —	Cumberland	9 00@— —
Buck, ₩ bag	2 10 @ —	Egg, hard	10 00@— —
Chilled, do	2 10 @ —	West Hartley	6 50@— —
QUICKSILVER.		**COKE.**	
Home trade, pr. flask	43 50 @44 00	English, to load	$8 00@ 9 00
For export	38 @	Do, spot, in bulk	10 00@— —
		Do, in sacks	12 00@— —
		Cumberland	9 00@— —

Eastern Metal Markets.

NEW YORK, July 13.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39¾	86¾	11 40	4 22½	20 80
Friday	39 13-16	..	11 25	4 22½	20 80
Saturday	39 13-16	87	11 25	4 22½	20 80
Monday	39 15-16	87½	11 25	4 20	20 55
Tuesday	39¾	86¾	11 20	4 10	21 45
Wednesday	39¾	86¾	11 20	4 10	21 50

Tin is steady at the decline. Quicksilver is steady. Borax is slower. Lead is weaker under more offering. Copper is unsettled. Pig iron is irregular and weak.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JULY 5, 1892.

478,212.—TIME LOCK—L. N. Bedford, San Bernardino, Cal.

478,213.—TIME LOCK—L. N. Bedford, San Bernardino, Cal.

478,217.—DENTAL FOECEPS—C. E. Blake, Sr., S. F.

478,310.—WHIP SOCKET AND REIN HOLDER—T. F. Burkhard, S. F.

478,157.—FILTER—O. Eastman, S. F.

478,278.—FIEE LADDER—L. H. Fowler, Vallejo, Cal.

478,426.—RAILWAY CHAIE—Silas Harrie, S. F.

478,427.—RAILWAY CHAIR—Silas Harris, S. F.

478,428.—RAILWAY CHAIE—Silas Harris, S. F.

478,105.—WOONEN PIPE—A. M. Hawks, Tacoma, Wash.

478,253.—TRIPOD—Jas. Hewitt, Berkeley, Cal.

478,345.—MACBINE FOR WRAPPINO PAPEES—J. F. Lintbicum, Sacramento, Cal.

478,366. — EXPLOSIVE COMPOUNN — Samuel Rodgers, S. F.

478,531.—CLOTB-MEASUEINO MACHINE—Wilcox, Hallenbeck & Wandell, Albany, Or.

21,689.—DESION FOR WATOH CHAIN—D. L. Fry, Lebanon, Or.

The following brief list by telegraph, for July 12, will appear more complete on receipt of mail advices:

California—Samuel E. Ball, Winters, fruit gatherer; Ira Bishop and A. F. L. Bell, San Fraocisco, automatic trap for cable conduits and lifting mechanism for cable grips; Walfred Burkman, San Francisco, brick machine; William J. Connors and W. W. Eddy, Grass Valley, amalgamator; John H. Gaetsche, San Francisco, grinding-wheel attachment; William T. Gregg, Lakeport, window frame; Theodore McDonald, O. R. Williams and L. D. Hitzeroth, San Francisco, rope-driving apparatus; Antonio L. Navone, Calistoga, saw-swagging device; William D. Rogers, Alameda, and J. D. Van Buren, San Francisco, envelope opener; John T. Smith, San Francisco, railway rail; Charles Vogel, San Francisco, cable railway grip.

Oregon—John Finney, Portland, link lifter.

Washington—John D. Kirkwood, Pullman, vaginal syringe.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and fu the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESE U. S. and Foreign Patent Agency, the following are worthy of special mention:

TRIPOD.—James Hewitt, Berkeley. No. 478,233. Dated July 5, 1892. The object of this invention is to provide a simple, light and compact tripod more particularly intended for small photographic cameras, with which it is better associated, in that by its lightnese and compactness it will not add to the burden of those photograpers who carry the emaller classes of cameras only hecadse they are convenient. The diameter of the legs of the tripod can be so small and their length so reduced that when freed from the tripod head, and the feet drawn into the lower ends, the whole can be secured in very small compass.

EXPLOCIVE COMPOUND.—Samuel Rodgers, S. F., assignor to the U. S. Smokeless Powder Co. No. 478,366. Dated July 5, 1892. This new explosive compound consists of a combination of certain substances named in the patent.

FIRE LADDER.—Lewis H. Fowler, Vallejo. No. 478,278. Dated July 5, 1892. This is one of that class of fire ladders in which pivotally connected ladder and link sections are so joined as to enable the ladder to be folded or extended. The invention consists, in connection with a ladder of this description and the framework in which it is mounted, of peculiar and novel power mechanism for raising and in-

clining the ladder at any angle, and lowering it. The object of the invention is to provide a fire ladder which is adapted to be folded into small compass and readily extended and adjusted to position, the operation requiring the exercise of but small power.

WHIP SOCKET AND REIN HOLDER.—Theodore F. Burkhard, S. F. No. 478,310. Dated July 5, 1892. This consists in a socket to receive the whip butt, a swinging lever arm adapted to receive and hold the reins between itself and said socket, and a locking device operated by the movement of the lever arm in receiving and releasing the reins to hold and relieve the whip butt. The object is to provide a combined whip socket and rein holder in which, when the reins are in the holder and the vehicle left unattended, the whip shall be locked in its socket and cannot readily or easily be snatched from place and stolen; also to provide, in connection with the whip socket, a simple, convenient and effective rein holder.

MACHINE FOR WRAPPING PAPERS.—John F. Linthicum, Sacramento. No. 478,315. Dated July 5, 1892. This is a device for wrapping papers and pasting the wrappers together. It is worked by foot power. In addition to these features, the address may be stamped upon the wrappers as they pass through the machine, a stamping wheel being used for this purpose. The roller carrying the addresses is moved forward at each up-and-down movement of the slide of the machine.

HOT JOURNALS.—The *Manufacturers' Gazette* says: "If a journal becomes hot, it is dangerous to pour oil upon it for fear of causing a fire. Neither is it advisable to stop the machine, since the hot bearing is likely to stick or "freeze." The proper thing to do is first to apply a mixture of one part of sulphur and four parts salt, and then stop the machinery. There is then no danger of sticking or of creating a blaze when the oil is applied.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

DELINQUENT SALE NOTICE.

THE BUTTE KING MINING COMPANY. LOCATION of principal place of business, San Francisco, California. Location of Works, Butte County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 4) levied on the 4th day of June, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
V. Gadesden	250	50	2 50
E. Clarke	15	20	1 00
E. Clarke	62	30	1 50
R. M. Pogson	13	200	10 00
F. H. Abbatt	18	100	5 00
A. E. Mintie	49	1,000	50 00
A. E. Mintie	138	1,000	50 00
A. E. Mintie	162	75	3 75
M. A. Carpentor	54	500	25 00
F. W. Spencer	230	2,000	100 00
F. W. Spencer	267	5,000	250 00
F. W. Spencer	268	3,000	150 00
L. C. Mintie	87	1,000	50 00
L. C. Mintie	139	1,000	50 00
L. E. Winans	97	100	5 00
L. E. Winans	211	400	20 00
J. Schoolcraft	110	50	2 50
J. Schoolcraft	143	50	2 50
J. K Secord	112	500	25 00
M. Secord	113	500	25 00
J. H. Elwood	114	100	5 00
J. H. Elwood	115	100	5 00
J. H. Elwood	116	100	5 00
J. H. Elwood	117	100	5 00
J. H. Elwood	118	100	5 00
W. H. Brundidge	119	1,000	50 00
J. Morton	125	500	25 00
F. C. Mintie	126	40	2 00
F. C. Mintie	127	10	50
W. L. Woodrow	128	300	15 00
E. H. Woodrow	129	100	5 00
O. Burchard	135	50	2 50
V. Neale	169	1,000	50 00
V. Neale	171	500	25 00
V. Neale	173	1,000	50 00
V. Neale	174	1,000	50 00
V. Neale	175	1,000	50 00
Mrs. O. J. Koenig	159	1,000	50 00
S. A. Winans	191	1,000	50 00
W. Lichtenberg	199	400	20 00
E. Mayo	246	100	5 00
W. M Pierson	257	250	12 50
R. B. Mitchell	258	250	12 50

And in accordance with law, and an order of the Board of Directors, made on the 4th day of July, 1892, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 723 Market St., San Francisco, California, on TUESDAY, the second day of August, 1892, at the hour of 8 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

W. C. LEWIS, Secretary.
Office, 723 Market St., room 43, San Francisco, Cal.

MINING AND SCIENTIFIC PRESS.
The Leading Mining Journal in America. Established 1860. Latest Discoveries in Science and improvements in Mining and Mechanic Arts illustrated or described. A Standard Illustrated Weekly published at $3 a year by DEWEY PUBLISHING CO., 220 Market St., San Francisco, Cal.

INVENTORS, TAKE NOTICE!
L. PETERSON, MODEL MAKER,
226 Market St., N. E. cor. Front (up stairs), San Francisco
Experimental machinery and all kinds of models. Tin and brasswork All communications *strictly confidential.*

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia Storey County, Nevada.

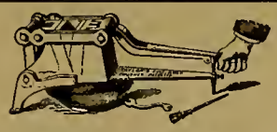
Notice is hereby given that at a meeting of the Board of Trustees, held on the seventh (7th) day of June, 1892, an assessment (No. 69) of Twenty-five (25) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twelfth (12th) day of July, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 4th day of August, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Trustees
ALFRED K. DURBROW, Secretary.
Office—Room No. 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

J. K. FIRTH & CO.,
225 and 227 First St., San Francisco, Cal.
Compressed Air and Water Power Machinery.

KNIGHT'S WATER WHEEL,
For Mills, Pumping and Hoisting.
OVER 300 IN USE.
All estimates guaranteed. Send for Circular



TAYLOR'S PATENT
Hand Rock Crusher,
For Fine or Coarse Crushing by Hand.
Good for Prospector, Assayer and Worker of Small Mines
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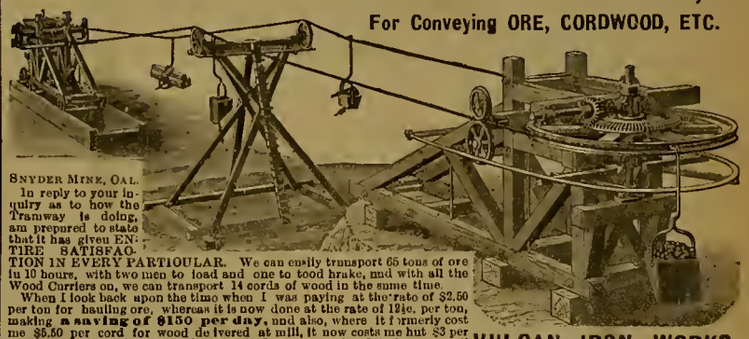

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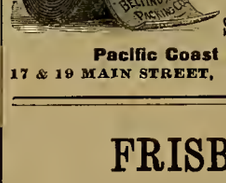

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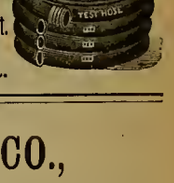

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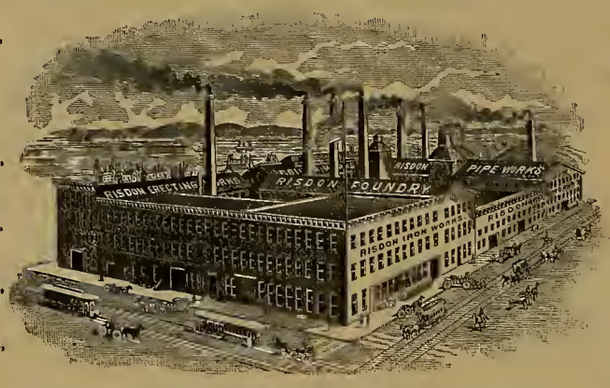

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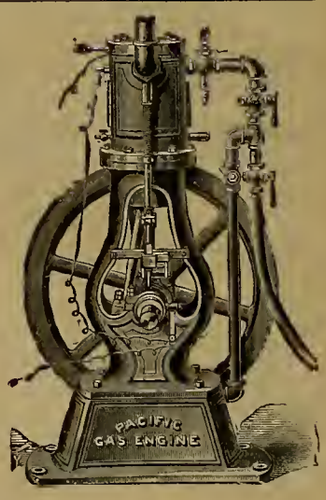

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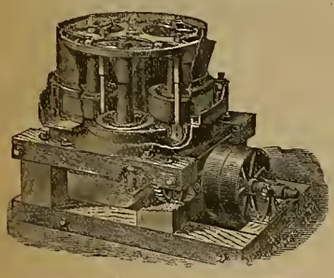

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VOL. LXV. — Number 4.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, JULY 23, 1892.

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Cooling Water for Condensing Steam.

On this coast where coal is so high in price, it is necessary to economize in its use in every way; and in this city water is expensive also, so that both items are of great importance where steam engines are used. Naturally, where large engines are required, the condensing type, as the most economical, is used; but where the water has to be purchased from the water company, that is a costly feature. It is only of late years that the cable railroads have commenced using the compound condensing enginee, the earlier roads built using the ordinary type where the steam discharges into the atmosphere. In order to economize the water used for condensing purposes, a plan has been adopted by which the heated water is pumped to the roof, cooled and again returned to be used in condensing the steam.

On this page is a cut showing the circulating pans on the roof of a cable-road engine house; and on page 59 are given sections and plan of the arrangement. As the steam exhausts into the condenser, it is condensed by jets of water and all this water flows into the hot well. From this, whatever hot water is required for feed water for the boilers is pumped back into them. The rest of it, by far the larger proportion, is forced by a circulating pump on to the pans on the roof of the building. These pans or shelves are shallow troughs of galvanized iron arranged in tiers on a slight incline so that the water in them flows back and forth for 1500 or 2000 feet, being cooled as it flows. The pans are five feet in width and about an inch deep it water flows in them. From one-third to one-half the volume of water is lost by evaporation. The circulating pans are set so as to go entirely around the building several times, on the roof or over such space as can be given to them. In some instances, as shown in the cut, vertical partitions are set in portions so as to make the water go back and forth as well as flow onward. This feature, however, is found to be of little value.

CIRCULATING PANS FOR COOLING WATER FOR COMPOUND CONDENSING ENGINES.

With the condensing engines the saving of coal is quite large, and it will be seen that by thus using the water repeatedly the water bills are materially reduced. Before this plan was adopted, high-pressure engines were used on the cable roads but no condensing apparatus was used. Some of them are still using the old system, but this described is used at both engine houses of the Omnibus system, on the California street and Union street systems. At each of the four engine houses there is some little variation in detail, but the general features are the same. It is found to be highly economical and satisfactory. The plan had been tried on a small scale at the Union and the Risdon iron works, but the application of the large circulating-pan system to cable engine houses was due to Mr. J. C. H. Stnt, the mechanical engineer of this city, who drew the designs shown in our engravings, as well as those for the other engine houses. The temperature of the water is reduced from 40 to 50 degrees during its passage through the pans according to the weather. During the visit of the members of the American Society of Mechanical Engineers to this city, this system attracted their attention greatly as one of the most interesting devices they had seen.

THE trouble at the Cœur d'Alene mines is practically at an end, and work has been resumed with wages at $3.50 per day for miners and $3 per day for shovelers, with the right to board and lodge where they please. The troops are still at the mines. Although the miners' union in the Cœur d'Alenes is completely broken up and the mine owners free of its halter, it will require the presence of the Federal troops for six months or more to insure the workmen immunity from attack. One hundred and eleven men have been arrested at Wardner, and there are 190 confined at Wallace. Marshal Pinkham has been looking over the prisoners and is busy getting out indictments against the principal ones. They will all be taken to Boise in a few days to answer charges of contempt of court, and will then be returned to stand trial on several indictments.

AT the annual meeting of the stockholders of the Union Consolidated Mining Company, 85,159 shares were represented and the following officers elected for the ensuing year: Robert Sherwood, president; Charles H. Fish, vice-president, and W. S. Lyle, Charles Hirschfeld and A. G. Gurnet, directors. D. B. Lyman was reelected superintendent and A. W. Barrows reelected secretary.

An Amalgamating Device.

Wm. J. Connors and Wm. W. Eddy of Grass Valley have patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an amalgamator arranged so that, the surface being kept clean, automatically presents a fresh surface to the pulp continually. The pulp passes from the mortar down a short apron, and thence falls on to a transverse, rotating cylinder. The surface of the cylinder is covered with silvered copper plate. The apron of the mortar extends to and lies directly above the top of the cylinder. Pivoted on this apron is a regulating plate, which can be raised or lowered and brought into more or less proximity to the surface of the cylinder to regulate the feed of the pulp according to whether the battery is using a coarse or fine screen. The undersurface of this regulating plate is an amalgamating one to catch the free fine gold.

In the bed of the frame below the cylinder is formed a receiving chamber. Into this the cylinder extends at its lower portion, and from it issues a drawing-off passage controlled by a plug. Across the lower back portion of the cylinder is a perforated water-pipe in a position to direct streams of water and wash off the surface of the cylinder into the receiving chamber below. A gravity scraper acts against the rear surface of the cylinder, its end being covered with rubber or other suitable protecting material. On the cylinder, which is continually rotating, the pulp falls and is carried by it over its front. The tailings fall into a discharge sluice, while the amalgam drops into the receiving chamber. Particles still clinging are washed off by the sprinkler, and the water and the scraper serve to effectually clean the surface of the cylinder, so that above it always presents a clean surface to receive the pulp. Any suitable mechanism may be employed to drive the cylinder.

AT the annual meeting of the stockholders of the California Electric Light Company, representing a total of 37,300 shares, the following were elected directors of the company for the ensuing year: P. B. Cornwall, Gustav Sutro, Arthur W. Moore, Geo. H. Roe, John R. Spring, William Kerr and D. Marcucci. The new board then elected Geo. H. Roe secretary and manager, Gustav Sutro president, and John R. Spring vice-president.

ALMOST the entire proceedings of the National Mining Congress were devoted to the silver issue. The next meeting will be held at Salt Lake on December 3rd.

THE guide who murdered Andrew Fraser of the Risdon Iron Works in Mexico has been captured and placed in jail. His name is Antonio Ochoa.

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SAN FRANCISCO, SATURDAY, JULY 23, 1892.

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[NEW THIS ISSUE.]

Mining Exhibition—California State Fair.
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☞ *See Advertising Columns.*

Status of Labor Unions.

The action of the labor unions in the recent troubles in Pennsylvania and Idaho calls attention to the irresponsibility attending such organizations. In the former place the men, naturally, we think, objected to armed mercenaries being brought against them. In Idaho, threats were made against the troops brought in to quell the disturbances, but in the end there was no resistance and the troops took possession of the company's property. It is probable that bad troops, instead of Pinkerton men, heen brought at first to Homestead, there would have been no bloodshed.

But if this Pinkerton band is a private one, with no responsibility to city, county, State or nation, and only to the men who hire it, what is the labor union which called it forth? Is it any more responsible a body itself? The unions are self-made, and not corporations created by the State in accordance with law. As at present existing, they are responsible to no one, not even to their leaders who may he deposed in a moment.

If the individuals composing these labor organizations were responsible for the acts of the body, as are the stockholders of a corporation, they would be a great deal more careful of how they damaged the property of others. A band of men calling themselves a labor union attack works, burn buildings, hlow up shops, destroy machinery and damage the plant, because they do not want others to take the places they themselves decline to fill at the wages offered. Now they have a perfect right to decline the wages and do all they lawfully can to compel the owners of the works to maintain suitable pay. But when it comes to arming and destroying property, there ought to be some means to hold the men to account for it. There is nothing in a labor union which is at all tangible, as far as suits for damages are concerned, but there should be.

Employers can be held responsible for accident to life or limb of employes. It is only fair play to hold the employe responsihle for his acts as well, especially when they are unlawful. The puhlic generally sympathize with the wage-earner in his contests with capital on the subject of day's pay, hut they have no sympathy whatever when overt acts are committed such as have occurred during the recent labor trouhles. Neither the steel works nor mines are puhlic institutions by any means. Both are private property owned by corporations. The men have no right to touch a single portion of this property without due process of law. Labor unions will never make any progress in public estimation or in practical results, when tbey commit such outrages as we have seen of late. If such occurrences are to become common, capitalists will simply decline to invest in properties where they are liable to be at the mercy of the unions.

Tbe general laws of the country should be arranged to meet the circumstance of the day. When a man joins a labor union, or, as a matter of fact, any organization having the avowed object of being opposed under certain conditions to employers, then some responsibility should be attached to him for the acts of the organization. At present the body of men calling itself a labor union becomes angry and destroys property, no matter for what reason, and the union cannot be called to account. A few leaders may be caught, but the men causing the damage generally go free. This is all wrong. Decent unions would have nothing to fear from responsibility; but when the members burn and destroy other people's property, they should be punished by fine or imprisonment. This is a country of supposed equal rights. Under present conditions, the laboring men can call on the employer for damages, but the employer has little chance to retaliate when occasion demands it.

The Caminetti Hydraulic Mining Bill.

The Caminetti hydraulic mining bill passed the lower house of Congress on Monday by a vote of 143 to 43, considerably more than the required two-thirds majority. It was suspension day for committee bills, and the measure was brought up then instead of waiting for the regular suspension day. Cbairman Cowles of the Committee on Mines and Mining presented the bill, and Caminetti made the opening and closing speeches in its favor. Loud and Bowers also spoke in its favor, and the three of tbem met every argument made against the bill by its opponents. At the very outset the old opposition showed itself. Watson of Georgia demanded a second, as Bailey had done when the bill was up before, and at one time there was fear of the bill suffering a second rebuff, as a quorum would not be present. Tbere was scurrying through the cloak and committee-rooms and the restaurant, and at last the necessary number passed through the tellers. Then Bailey and Watson attacked the measure on the ground of unconstitutionality, maintaining that Congress had no right to interfere; that it was a matter for the State to attend to; that the enactment of such a law would be substantially a reversal of the decisions of the State courts. Bynum of Indiana made the novel statement that the Sacramento and San Joaquin rivers were not navigable. Upon these points the House was set right hy tbe Californians, who also showed the great benefits that would accrue to the State by the measure.

The hill is by no means the same as originally drafted, many amendments having been made to it. The Government will build no debris dams at all, that being left to the miners themselves, under regulations of a debris commission composed of Government engineers. The appropriation has been cut down from over $400,000 to $15,000, or just enough to pay the expenses of tbe commission wbich will have the supervision of the construction of all impounding dams and restriction works. There are other changes in the bill, but tbey apply principally to the duties of the commission and the method of procedure to secure permission to build a dam.

One amended section provides tbat the jurisdiction of the commission shall extend to all mining in the territory drained by the Sacramento and San Joaquin river systems. Hydraulic mining, directly or indirectly injuring the navigability of the river systems, carried on in this territory, except as permitted under the provisions of the Act, is prohibited and declared to be unlawful. Another new section of some importance, suggested by the California engineering commission, provides that the commission, in order to secure harmony in the work, to he constructed for reclamation and drainage purposes on the river systems mentioned, is empowered to consult from time to time with the commission of engineers, which is authorized to join in such conferences by the laws of the State of California. The result of such conferences shall be reported to the chief of engineers for transmission to Congress. The consent of the United States, in so far as it is necessary to confer the same on account of its reserved control over these navigable rivers, is granted to the State of California or any municipal or local organization authorized by the laws of the State to construct such works at its expense, provided that whenever the navigable waters of the systems are or may he affected therehy plans therefor shall be recommended hy the commission created by this Act and approved by the chief of engineers of the United States army.

Congressman Caminetti says the bill as it passed should properly be entitled a bill to create a California river and debris commission. The Sacramento and San Joaquin rivers will, if it becomes a law, be treated like the Missouri and Mississippi rivers are by the respective Government commissions in their charge. Such treatment means their permanent and systematic improvement. This is the certain result. The bill offers a solution of the hydraulic mining question. Experience will show wherein it needs modification. Congress, now that the path is opened, will await results and without doubt grant such changes as will be for the public interest. The great difficulty in this fight was that the miners were even asking for a law that has no precedent—an innovation in fact. It has taken years of work in session after session of Congress to secure the laws organizing the Mississippi and Missouri River commissions. These did not contain the complicated questions involved in the present bill. Changes have been made to meet tbe requirements of different members of the House, but an analysis of the bill will develop the fact that an important forward movement has been made hoth for river improvement and a solution of the mining problem.

The text of the bill, with all the changes which were made in it before passage, is about the same as when it came from the committee, except that in Section 3 the last sentence is made to read: "Hydraulic mining, as defined in Section 8 hereof, directly or indirectly injuring the navigation of said river system carried on in said territory other thau as permitted under the provisions of this Act, is hereby prohibited."

The end of the proviso in Section 15 is made to read that "The owner or owners of such mine or mines be permitted to commence operations."

Sections 20 and 24 are stricken out entirely. In Section 25, the word "may" is changed to "shall," so as to compel the prevention of injury to navigahle rivers, instead of leaving it merely permissible to prevent it. The appropriation of $15,000 is made immediately available to defray the expenses of the commission. All reference to exact locations of dams, as originally provided for, is cut out. The bill, as drawn, appropriated specified sums for dams at certain points on each stream, but this is all dispensed with. The miners can tbemselves now build under advice of the commission of engineers, such dams as they may desire to restrain the debris. Upon these being constructed, the miner can apply for a license to work his mine. A hearing will be had before the commission, and if the commission is satisfied the dam will accomplish its purpose without injuring rivers or adjacent lands, a license will be issued. When issued, the miners can go to work. If, however, at any time the engineers find the works do not restrain the debris, they can revoke the license.

Many miners, without douht, will find fault with this bill and object to several of its features if it becomes a law. Tbis is inevitahle, but tbe general interests of the whole community are considered in tbis bill—those of the miners and the farmers. The clause prohibiting all hydraulic mining, except under provisions of the Act, will be considered a sethack by some miners, but this is of no moment, for tbe simple reason that it is practically prohibited now. Moreover, the fact is a clause was put in the River and Harbor bill of 1890 prohibiting the dumping of refuse or waste of any kind into rivers or harbors. Until that became a law tbe Government had no power to prevent the destruction of navigable streams. A severe penalty is provided, and the U. S. Courts given jurisdiction to hear cases. This covers the case of tailings from a gravel mine, as well as sawdust from a sawmill, and is general for the whole country.

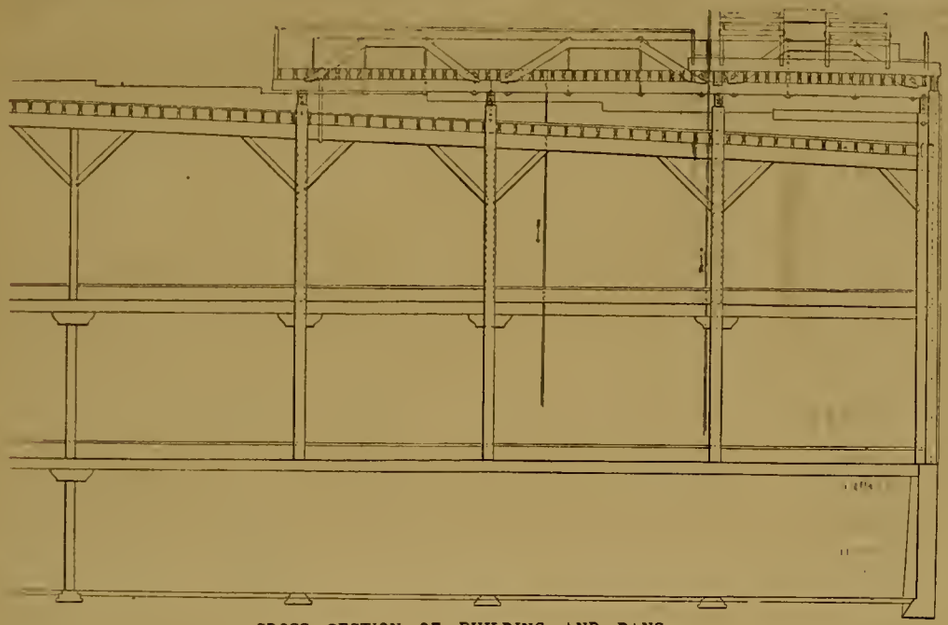
The miners have been in a position to be jailed and fined for some time, and there was nothing giving them any right to mine hy the hydraulic system. But tbis bill does give them this right under certain specified conditions. It gives them a chance to work their claims where they can do it without injuring other interests. This is all they have asked for practically, and all they can properly expect. The clause providing for the right of eminent domain was stricken from the bill and was not essential. The General Government and the State already have laws for this purpose under which private property can be condemned for public use.

One objectionable feature is the provision requiring the dams to be actually built before a license can be applied for. But doubtless the engineers, on consultation, can give some kind of assurance as to the nature of the works tbey will accept. There is another thing, too. For years many small mines have continued to work, paying nothing toward the litigation, and leaving the large companies to bear the burden. These small mines will, if this bill passes, come under the law and have to expend money for restraining works also.

While there are, as stated, some features in this hill which are objectionable to tbe miners, they ought to be satisfied that, at last, Congress has listened to them, and gave them some kind of a show to work hydraulic claims. For years they have heen under the han, but if the bill becomes a law they may carry on mining under its provisions. A license from these Government engineers will so fix the miner that he will not be liable to injunction from State or Federal courts; and if he takes care of his debris he can continue to work. This ought to satisfy hoth miners and farmers, and no cranky individual of the latter class can, as now, stop a whole mining section from working. The bill goes to the Senate and Congressman Caminetti will do all he can to aid Senator Felton in urging it there. Even if it does not pass the Senate this session, it may next, and will not have to go back to be considered hy the House again. The bill, thus far, may be considered a decided victory for the hydraulic miners of California.

Asphalt for Reservoirs, Ditches and Flumes.

The abundance of asphalt found in this State has led to its utilization in many ways aside from the usual ones of paving, roofing, etc. Of late it has been considerably used in lining reservoirs and flumes and is found to answer this purpose admirably, taking the place of cement. Reservoirs lined with asphalt are now used in San Diego, Los Angeles, Ventura, Santa Barbara and Kern counties where the material is mined and is very inexpensive. In some places, too, they have lined ditches with brick and covered that with asphalt to prevent loss of water. The asphalt is mixed with sand or gravel, or used in combination with brick or stone as seems handiest. In the irrigation districts of this State this material is liable to enter largely into the works in the future.



CROSS SECTION OF BUILDING AND PANS.

Mr. Farwell of San Francisco recently built near San Gabriel, Los Angeles county, a reservoir of about 100x170 feet in area by some 10 feet deep, using asphalt concrete of three-inch thickness. The composition embraced 92 per cent gravel to 8 per cent pure asphalt from the Sunset oil works of Kern county. The finish was one-eighth inch of hot liquid asphalt. The work was well tamped and rolled smooth.

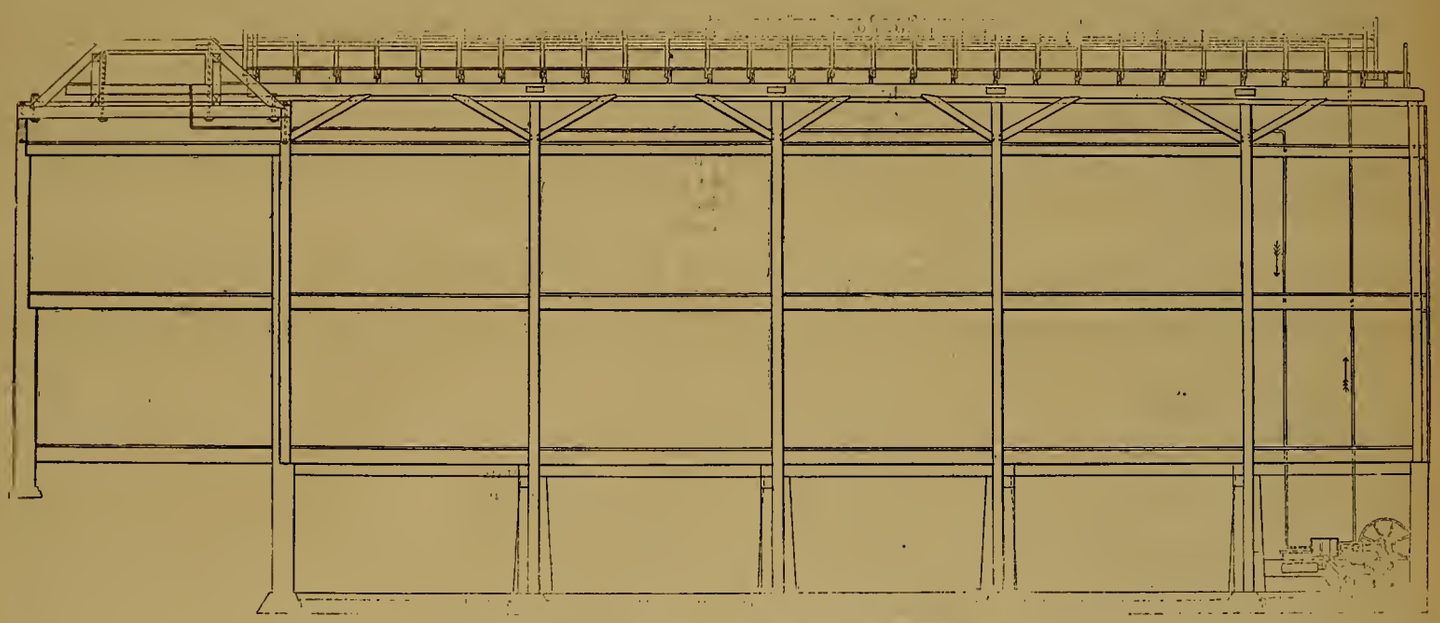
The Las Posas Water Co., near Hueneme, and the Santa Paula Water Co., both have large reservoirs of similar structure which are also giving good satisfaction.

The Kern County Land Co. had a flume, 1800 feet in length, leaking water so badly as to seriously injure the grape vines in its vicinity. A coating of asphalt was applied to the flume so effectually that the same vines now require irrigation in the usual way.

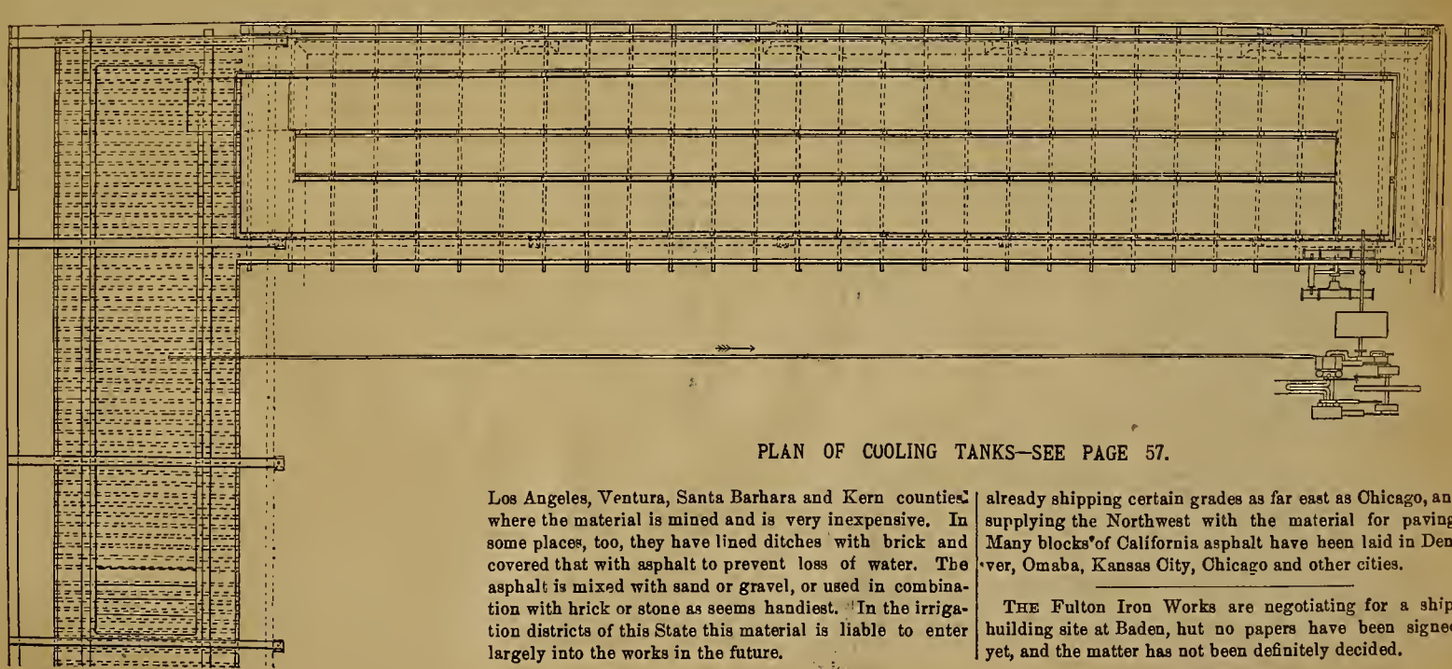
The Poso Irrigation District managers are now building a large flume, some four feet deep by seven feet wide, some miles in length, which will be coated outside and inside by the Standard Asphalt Co. of Bakersfield.

The feature of durability of such work is well established. As asphalt is furnished in a cheaper, more uniform and convenient form for application its use is becoming greatly augmented. By its use, destructive vegetable growth is avoided on both outside and inside of the flume. No unpleasant taste is imparted to the water, which passes with reduced friction, thus adding to the volume of carrying capacity of the flume.

Over 100,000 tons of asphalt were imported to the United States from the Island of Trinidad for the year 1891, about 95 per cent of which was used for paving purposes. California's excellent products in this line should rapidly reduce this great foreign importation. We are already shipping certain grades as far east as Chicago, and supplying the Northwest with the material for paving. Many blocks of California asphalt have been laid in Denver, Omaha, Kansas City, Chicago and other cities.



LONGITUDINAL SECTION OF BUILDING AND COOLING PANS ON ROOF.



PLAN OF COOLING TANKS—SEE PAGE 57.

THE Fulton Iron Works are negotiating for a shipbuilding site at Baden, but no papers have been signed yet, and the matter has not been definitely decided.

"Serpentine Rocks."

Some Geological Facts for the Practical Miner.

SAN FRANCISCO, July 16, 1892.

TO THE EDITOR:—The investigation and study of the group of serpentine or altered eruptive rocks are of the greatest importance to the practical miner, as in connection with these rocks, most of our metalliferous lodes, veins and deposits are met with, yielding metals of the first and second class. For instance, of the former the Idaho mine, Grass Valley, is the richest and deepest paying gold mine on the Pacific Coast. The New Almaden quicksilver is one of the richest quicksilver mines in the world.

Platinum has also been found in the serpentine rocks of the Ural mountains. Of the second class, large deposits of nickel have been found, with chromic iron, etc. In New Zealand the native alloy of nickel and iron was found in small grains or scales in the serpentine.

One fact, and I have never heard of attention being called to it, and which is very necessary for surveyors to know, is that where the rock exhibits the characteristic "serpent" colors, from which it is named, it contains a large proportion of magnetic iron ore, so much so as to attract the magnetic needle, so that compass surveys at such points on the surface or underground cannot be relied upon.

Serpentine is essentially a hydrous silicate of magnesia. When pure, it contains at least two-thirds of silicate of magnesia; but it is mostly impure, through admixtures with silicate of protoxide of iron, argillaceous matter and carbonate of lime and magnesia.

The variation in its color, so marked and plainly to be seen, is due to different states of oxidation of the ferruginous and sometimes nickel matter which the rock contains. Serpentine when heated yields about ten per cent of water.

The minerals which occur as accessories in serpentine are numerous and like those in crystalline schists, with which rocks serpentine is commonly associated, to which, however, may be added bronzite schiller-spar, hematite, both massive and as specular iron, dolomite, calcite, brucite, magnesite, native copper, copper pyrites, copper glance and asbestus. Serpentine seems especially to result from the decomposition of rocks rich in olivine. Prof. Bonney regards the serpentine of the Lizard (England) as a truly eruptive rock, and considers that the sedimentary rocks which surround it had been metamorphosed before its intrusion.

Serpentine for the most part is jointed into irregular massive or gnarled masses, and if bordered by other rocks of a different character and age, no trace is left of its original composition, like the footwall of the Idaho gold mine.

It is reasonable to conclude from the altered condition and jointed structure of the serpentine that no regular fissure of any length is likely to be met with in them, so that metalliferous deposits are only found in those parts where intrusive igneous dikes of a later age have forced themselves through the serpentine, or where it is bordered by rocks of a different formation, the spaces between such rocks or dikes and the serpentine forming fissures, portions of which are sometimes occupied by metalliferous lodes or veins.

The practical miner could hardly select a better field for examination, investigation and instruction, and from which he can so easily obtain information that might save himself and clients very large sums of money, than the serpentine range or belt of rocks between Grass Valley and Nevada City affords. He can select hand specimens from the surface for a very long distance, showing the different stages of alteration in the rock, and also from depth at the shaft, of the St. John mine, the Coe, New Eureka and also at a shaft now being sunk near the Maryland claim.

In a paper read before the London Geological Society, May 22, 1878, by Prof. Bonney, on the "Serpentine and Associated Rocks of the Ayrshire Coast," he says: "In the twenty-second volume of this journal is a paper by Dr. J Geikie on the 'Metamorphic Lower Silurian Rocks of Carrick, Ayrshire. The author endeavors to prove that the rocks of the district, with some few slight exceptions, are of sedimentary origin, a feldspar porphyry being the maximum stage of metamorphism exhibited by the feldspathic rocks of the district. The 'dioritic rocks,' diorite and hypersthenite, both of which are occasionally foliated, are also regarded as of metamorphic origin; and lastly, the compact serpentines, like the altered strata with which they are associated, are truly bedded rocks."

Dr. J. Geikie's paper was severely handled on chemical and mineralogical grounds by the late M. D. Forbes, and Prof. Bonney, after a very careful examination, arrived at the following conclusions:

"It results, then, after consideration of both the appearance in the field and of microscopic examination:

"1. That the serpentine of this district is intrusive, and, like so many others, is an altered olivine rock.

"2. That there is no hypersthene rock, but gabbros of two ages, both of igneous origin—the first extraordinarily rich in diallage, so that it can hardly be called a gabbro; the second much resembling the later gabbro of the Lizard Cornwall.

"3. That the porphyrites of Balerenchan and Pinbain H. M. are true igneous rocks, and very probably remnants of lava flows associated with tuffs or agglomerates.

"4. That several of the rocks into which the serpentine is intrusive are also igneous, and are augitic, not hornblende.

"5. That there are some doloritic and basaltic dikes of later date than all the above.

"6. That Dr. Geikie's conclusions as to the nonigneous character of the rocks of this district are, so far as regards all the above named, unsupported by either stratigraphical, petrological or lithological evidence, the proofs of intrusion being remarkably clear and indubitable, so that this district must be removed from the list of those which have been supposed to favor the theory of the production of pseudo-igneous from stratified rocks by selective metamorphism."

MELVILLE ATTWOOD.

Kern County Oil Districts.

Present Outlook in the Region.

SAN FRANCISCO, July 12, 1892.

TO THE EDITOR.—Looking at the topographical map of California we see one of the largest cultivated valleys in the world, its northern half drained by the Sacramento river, and something more than one-half of its remainder, including the southern half, by a system of rivers and lakes, including the San Joaquin river, which unites the waters from the south with the Sacramento, in the Bay of San Francisco. Traversing the valley northward, the last city met of importance is Redding, the prosperous seat of Shasta county, located on the bank of the Sacramento river, where its bright waters seem fairly to leap into the narrow northern extremity of the great valley of California. Looking southward, the last city viewed in the valley is Bakersfield, the center of a broad area of the richest and most productive soil.

With the most perfect system of irrigation in the United States, abundant supply of good water, the lands of Haggin & Carr, extending for 12 to 15 miles in several directions from the city, have proved remarkably suitable for the cultivation of raisin and wine grapes, and nearly all kinds of temperate and semitropic fruits, nuts vegetables, grain, hay, hops, cotton, etc. This rich land is now fortunately being colonized and sold in quantities to suit settlers on easy terms, and the modest pioneer residences of an incoming industrious and thrifty community of home-builders, is pleasantly noticeable in various directions here and there.

Taking a bird's-eye view we see that the Sierra Nevada and Coast range of mountains unite in forming high, semi-circling backgrounds on the east and south, and west of Bakersfield. A low gap on the east indicates the descending course of Kern river, which supplies the beautiful and abundant water that quickens and fattens the growth of stock and plant life in the rich valley. Along its head waters are rich and lasting mines of precious metals. Fifteen miles south of Bakersfield is the old bed of Kern lake, and thence about nine miles north the Buena Vista reservoir of Henry Miller, (formerly Buena Vista lake,) a shallow basin of water over six miles in diameter.

In the low foothills of the Coast range, ten miles farther southwest, are the now important Sunset oil locations, about 30 miles in a direct line southwest of Bakersfield. The petroleum belt here seems to have an almost exact course from southeast to northwest. Claims aggregating six to eight miles in extent are here located by different companies. Fifteen miles to the northwest is situated another large chain of claims known as the Buena Vista section. In addition to excellent petroleum and rare asphalt deposits, sulphur, gypsum and kaolin are among the probable treasures of the section. The Sunset and Buena Vista locations range only about six miles from the line of San Luis Obispo county. The new railroad being rapidly built, reaching out toward these new oil fields, is backed by by the S. P. Co., and will soon be a substantial aid in the development of this new and promising section. It is being rapidly constructed, some 40 miles in length, to the Buena Vista works, which latter point is a trifle south of an air line, 33 miles west of Bakersfield.

THE INDICATIONS.

Present indications are that Kern will prove at least one of the very best petroleum counties on this coast. So far its most notable oilfields are those known as the Buena Vista and the Sunset. The former, worked over 20 years ago by the Buena Vista Co., had limited reduction works. The main object was to produce illuminating oil, which was accomplished in a limited degree at least. Then Stockton was the nearest city for transportation by rail or steamer; it required over 200 miles of transportation by teams, and of course the enterprise proved a failure after a large outlay by the company. But little work has been done in the vicinity of the Buena Vista deposits since. Lately, however, the Tulare Petroleum and Mining Co. have placed a substantial boring outfit on their grounds. There is an immense ridge of asphaltum deposits situated about two miles southerly from the old retorting works, which, it is thought, must some day prove of immense value. Visiting that section in November, some seven years ago, the writer witnessed, in one of the ravines, during the middle of the day, the singular sight of a natural stream of black oil, a foot or more wide, moving as "slow as molasses" toward the valley below.

THE GREATEST POINT OF SUCCESS.

The Sunset and neighboring claims, which are now attracting the most attention, and upon which recent developments evidently have caused the greatest faith in future oil developments in Kern county, are among later locations, some 15 miles south of Buena Vista, and about 35 miles by road southwest of Bakersfield. The first 12 miles or so of the wagon road route from Bakersfield to these oil fields leads through the rich irrigated lands of Haggin & Carr, now being sold in subdivisions by the California Land Co. The remainder of the way is a very level, hot, dusty plain, although a few years ago 10 or 12 miles of the distance was a rank tule swamp bordering each side of the slough then connecting Kern and Buena Vista lakes.

HAZELTON SETTLEMENT.

The settlement around the Sunset claims is named Hazelton after a favorite son of H. A. Blodgett of Bakersfield. It is expected that a postoffice will ere long be established. There being already a postoffice named Sunset, the change of name is quite appropriate, Mr. Blodgett having been the leading spirit in the late and important development of these oil fields. Himself and partner, Solomon Jewett, form the well-known pioneer banking company of Kern county. They have, from time to time, secured, by purchase, lease and location, what is supposed to be the best portion of the petroleum belt at this point. The latest purchase was that of the original lessee, Chas. Barnard. Their tract now ranges from one to two miles in width and five to six miles along the belt.

The first boring was done for the original Sunset Company by John Hamhleton and sons on what was commonly termed Asphaltum hill, on the Sunset claims, four or five years ago, the result being a product of very black, heavy oil, appearing (except in thickness) very much like the asphaltum varnish in common use. It was nearly three years ago that Blodgett & Co. obtained possession of the Sunset and a few adjacent locations, and went vigorously to work to bore larger and deeper wells, meeting at first with only moderate encouragement.

About two years ago Mr. W. E. Youle was engaged as superintendent to take entire charge of the works. We found him an intelligent man of over 30 years' experience in the oil fields of the United States, having been employed during the last 15 years in Santa Clara county, Newhall, Puente, etc. In fact, Mr. Youle has grown up in the business, and thoroughly understands it practically in its details and most important features.

THE SUNSET WORKS.

At the original Sunset works are situated the boarding-house, superintendent's office and the largest set of wells in the district, some eight in number, within a radius of about 200 feet. These are all connected with one pumping system operated by a single engine. From the oldest well is pumped heavy black oil, which is now being manufactured into asphaltum varnish of good quality. From the hill on which these works are located, and its slopes, is being mined an excellent quality of solidified asphaltum, which is broken into fragments and placed in vats.

With each charge worked a quantity of heavy oil is used to facilitate the reduction of the material into solid blocks. These blocks are molded in wooden boxes containing about 100 pounds. They appear darker and less brittle than ordinary resin. About 14 hours are occupied in making a run. The present works are capable of producing 100 boxes in 24 hours. This material is shipped to Portland, Oregon, also as far east as Kansas City and Chicago, where it is melted and mixed with sand and other suitable substance, forming an excellent and perfectly uniform paving material similar in appearance to the bituminous-rock paving used in San Francisco. Quite recently a trainload was shipped east, showing the demand is good and increasing.

LIGHTER GREEN OILS.

This portion of the location up to date has been the most profitable of any in the county. Recently, however, Mr. Youle has succeeded in developing a fine well of a lighter and green oil on what is known as Section 28, Township 11 North, Range 23 West, Mt. San Bernardino meridian, a little over a mile southeasterly from the Sunset Works. Here is located another steam engine, drilling and pumping plant. The developmeot at this point seems a very substantial one, justifying the belief that the district will be one of the best, most permanent and productive fields on the Pacific coast. Again, northwesterly from the Sunset is another steam boring and pumping plant on what is known as Section 13. Here Mr. Barnard was found handling the drill in boring a large well through sandstone formation at over 300 feet depth. At this place quite similar light green oil is found. In fact, the whole plant seemed besmeared green with the slums and spatterings from the work of boring. The indications were similar for good results to those on Section 28. There was already some development of heavy oil and solidified asphalt on this, the Montverde claim. In our interview (in the early part of May), Supt. Youle reported that the drill had just reached into the oil formations on Section 28. The producing capacity of one well there was already equivalent to 20 barrels per 24 hours of the lighter and green oil of about 25 degrees gravity. The oil at the Sunset claims he considers excellent for fluxing the crystallized asphalt in the melting process for producing material for paving, etc.

The near association of oil so homogeneous to the crystallized asphalt, with both substances in abundant quantities, is a fortunate circumstance. No other flux could be so good in the place of this associated deposit of heavy oil. There are the strongest of reasons for believing that the deposits here are of a lasting nature, and there are no evidences of a reduction by the pumping from the wells.

The simple yet substantial and effective way in which Mr. Youle is operating (by wooden connecting bars and oscillating cams), continuously eight pumps on as many wells with a single engine, seemed quite creditable to his practical genius. Much of the heavier oil at these claims is about ten degrees gravity, and the present capacity in the neighborhood of 20 barrels per day. It is particularly good for varnishes, printing ink, etc., and contains a larger percentage for such purposes than any other found on the Pacific coast.

Mr. Youle considers the evidences very positive for this district, proving one of the largest and most permanently productive oil fields on this side of the continent. Unmistakable evidences of the deposit exist continuously for a distance of over four miles on the belt. The croppings are well defined, without interrupting faults, with strata dipping (as is considered favorable) to the north. The location is superior also in point of the contour and lay of the land. Here the elevation is about 700 feet above the sea with a gradual sloping country for transportation. The most practicable machinery is being used for the actual work to be accomplished. While things are plainly constructed, there is that apparent good common sense pervading the general management which points to success wherever success is possible. The workmen, we have reason to believe, are well provided and fairly treated and paid.

The new well being sunk on Section 13 is located on the northeast corner of the southeast eighth. It was 300 feet deep and looking well. It was considered as well located as that on Section 28, and is supposed to have equally good chances. The indications so far are quite similar, and it is naturally to be expected that better results will attain with the progress of the work on both sections. Several ten-animal (horse and mule) teams are employed to haul the products of these different mills to Bakersfield.

Henry Miller has lately built a narrow-gauge railroad

some 15 miles in length, along the level of Buena Vista lake and south into San Emidio canyon, for transporting rock to face several miles of the artificial embankment now being washed away on the east side of the lake. By shifting six miles of this narrow-gauge track and the construction of a short branch from the S. P. branch from Bakersfield, complete railroad connection could be made on very favorable grades for transportation from the Sunset wells. The Southern Pacific branch mentioned will, within a few days, be used for greatly shortening the wagon transportation from Hazelton. Since writing the above, it should be stated that the well here mentioned finally reached a strong flow of artesian water, which is likely to prove valuable, owing to the scarcity of suitable water for steam and irrigating purposes in the district. Other oil wells will be bored in the vicinity.

STANDARD ASPHALT REDUCTION WORKS.

Adjacent to the S P. R. R. depot at East Bakersfield (formerly Sumner) have been established the Standard Asphalt Company's Reduction Works of the latest and most approved plans. The raw oils are brought to these works for reduction. The plant consists of a receiving reservoir capable of holding 60,000 gallons set in the ground and connected by pipes and pumping apparatus to the storage tank. Thence the crude oil goes by gravitation to the boiler and still, and then through the condenser, which contains 384 feet of 2-inch pipe. A charge of 107 barrels can be treated in about 14 hours. There is suitable apparatus for the production of asphalt varnish and oil for lubricating and fuel. The plant is supplied with improved petroleum-burning apparatus. It seems of the latest and best approved designs, second to none for the amount of work it is intended to do.

Under the able management of Mr. Louis Blankenthorn, the reduction works are operated by F. A. Reeder, a mechanic and operator of experience in his specialty. To the enterprise, pluck and perseverance of H. A. Blodgett, those directly interested in the asphalt resources of Kern county are greatly indebted for the promising developments already made. He has also largely helped to give other important improvements a start to the welfare of the county, and to many of its citizens of wealth, as well as those of moderate means and industry. What has already been done is indicative of more to follow, and we expect far better results to report from time to time. D.

THE Bunker Hill and Sullivan property is the star mining claim of the Cœur d'Alene district. It has one of the crack mills of the West, if not of the world, and more men are employed than in any other mine in that section. Mr. John Hayes Hammond picked out the property and managed to get a lot of friends interested to work it. D. O. Mills, Will Crocker, Perry Belmont, Cyrus H. McCormick of Chicago, Mr. Sloane, Vanderbilt's son-in-law, Creighton Webb and others have stock in the company. They have been getting some first-class dividends from time to time, and everything looked favorable for more, until the present difficulty arose. The property is a rich one in a rich district. Experts have reckoned over $2,000,000 in silver and lead in sight in the tunnels, drifts and ledges. The plant has lately been equipped in a manner almost palatial. The mill's capacity has been doubled, so that it can now easily work out 80 tons of concentrates daily. As it stands, this mill cost every cent of $350,000. There is a very swell little brick office, snugly furnished. There is a suspension cable tramway from the mine to the mill, about two miles.

MINING IN SHASTA.—The Shasta *Democrat* says: There are few men in Shasta county who have a stronger faith in the mineral development of the county than has the editor of this paper. There are few men in the county who have watched with keener interest, for the past ten years, the gradual development of Shasta's mineral wealth, firmly believing that intelligent, practical work, backed by determination and faith, would ultimately prove to the world that Shasta county is incalculably rich in gold and silver-bearing ores. We need not recount the achievements wrought by intelligent mining development since 1886, when, after four years of persistent effort in these columns, new life was injected into mining matters, energy was revived, and new men and outside capital began to take an interest and invest in mining property in the county. The record since 1886 would be commendable to any mining region; still, the development and output ought to be tenfold more than it is to-day. Every practical miner in the county will bear us out in this assertion, and we could to the most skeptical why it is so.

STOCKTON'S ELECTRIC ROAD.—The new electric street-railroad system is now in successful working order, and the cars were run for the first time last week. The complete system has 11 miles of track. At the trial a speed of 12 miles an hour was reached, but the electricians did not attempt to run up to the full speed of 23 miles. The cars are the double-end pattern carrying 28 passengers, and were built in Stockton. The motors are the Thomson-Houston pattern and are noiseless. The roadbed is unsurpassed anywhere, and was laid by H. C. Holmes of San Francisco. The company is composed of H. J. Corcoran, I. S. Bostwick, E. R. Hedges and Joseph Fyfe, all Stockton business men.

SILVERADO.—Interest in Silverado, the recently located diggings in the Gold Basin district, Arizona, continues on the increase. While the first rush from Kingman and vicinity is over, there is every prospect of an invasion from more distant points, but at this particular time such a movement is far from desirable, as it would surely lead to deplorable results, owing to the scarcity of water. At present there is not more than water sufficient for the men and teams now there. An outfit has gone out equipped to sink wells for water, and there is also a proposition on foot to carry water from the surrounding springs into the camp.

Mr. MacArthur's Ideas of the Cyanide Process.

Mr. John S. MacArthur writes from Glasgow, Scotland, to the *Engineering and Mining Journal* as follows:

In the issue of May 21st your readers are favored with an article on this process which, among other things, indicates that you are not quite aware of the extent to which it is now in use. Besides the Robinson, the MacArthur-Forrest process is being operated in connection with the following mines: In the Transvaal, Salisbury, Ferreira, Langlaagte, Champ d'Or, Nigel, Black Reef, Crown Reef, Meyer & Charlton, Juhilee, City & Suburban, May Consolidated, New Primrose, Stanhope and Transvaal Gold (Leydenburg). Though some of the largest in above list were not in full working order, the output for April was 13,500 ounces, at from 600 to 800 fine, and though the tonnage is not definitely given, we know that it was not under 20,000 ounces.

In South Africa the operations have been conducted principally on tailings, though concentrates and ores direct from the mines are also worked. The scope of the process is, however, not confined to African tailings. In New Zealand the proprietors of the MacArthur Forrest process made a contract about three years ago to work the entire produce of the Crown mines. Unfortunately for both parties, the development of the mines did not permit a supply of ore sufficient to keep the plant fully employed; nevertheless, every ton of ore delivered has been satisfactorily worked according to contract, and the Crown Mines Co. has now acquired a more extensive local control and more permanent interest in the process. The Sylvia G. M. Co. has also adopted the process under license and payment of royalty.

It is true that a few trials involving 1 ton 16 cwts. were made at the famous Mount Morgan mine of Queensland, and that the manager did not see his way to recommend the adoption of the process, because in his opinion the operation was too slow, *i. e.*, the plant required for the daily tonnage would be too great. As our extractions were from 91 to 100 per cent with ore crushed to an ordinary degree of fineness, and with a normal consumption of cyanide, the question of chemical efficiency did not arise. The calculation of the manager as to working capacity of plant was based on the working of the experimental lots amounting in all to 1 ton 16 cwts., and did not agree with our experience derived from continuous systematic work.

Naturally, the Mount Morgan Co. was guided by its manager's opinion and no contract has yet been made. There are, however, other mines than the Mount Morgan in Queensland, and from them we have bought, paid for and worked hundreds of tons of their concentrates and sludges (residues from pan amalgamation of concentrates). Some time ago a trial of lots of concentrates from several different mines was made of the MacArthur-Forrest process against pan amalgamation. In every case the difference was in our favor. In one case (lot from the Day Dawn P. C. G. M. Co.) there was some doubt about the accuracy of the figures, the trial was repeated and all figures carefully confirmed with the result that the Day Dawn P. C. G. M. Co. has now adopted the process under license and payment of royalty.

Referring to operations in America, the Gold and Silver Extraction, Mining and Milling Company of Denver is in a better position to give a correct statement of affairs than the "Deadwood papers," which in this matter at least "occupy a position of greater freedom and less responsibility."

Had the proprietors of the MacArthur-Forrest process ever committed themselves to the statement that it would work every ore, you and all sensible people would have classed them with the quack whose pills cure all diseases. What we do maintain is that it is of general application rather than limited—a good, sound, practical, commercial process, with advantages more and drawbacks less than other processes.

The following is a statement showing the work done by the process at the Crown mine, New Zealand:

Statement of 263 tons 7 cwt. of Crown mines ore treated at Karangahake by Cassel process:

	Gold, ozs.	Silver, ozs.
263 tons 7 cwt. contained by assay	425	940
Recovered and sold to the bank	384	664
Percentage of recovery	90½%	70½%

The above ore was ground through a 30-mesh in place of 60, consequently 15 per cent of the ore refused to pass a 60-mesh. Had the grinding been as required by the process, much better results would have been obtained:

	Per ton.
Contents of ore before treatment	£7 0s. 0d.
Balance not recovered	£0 15s. 6d.

Formerly a similar ore treated by battery treatment yielded bullion of the value of £2 per ton.

Huntington Mills in Concentrating Works.

Mr. Wm. B. Roberts, of Queensland, writes as follows to the *Mining Standard* of Sydney, N. S. W.:

With reference to your mention of the failure of the concentrating machinery at Mount Willis (Vic.) to do its work satisfactorily, owing to the sliming of the tin in stamping, it has struck me that the following suggestion might be of some service. I merely wish to point out that as I have not seen or made tests on the ore, it is merely given as a *suggestion* that may, or may not, be of service. I am inclined, however, to think it would.

For the crushing of ore for concentration, where too firm a communication of the particles, *i. e.*, sliming, is a disadvantage, I have found nothing to approach the Huntington mill. The method of crushing by rotary grinding instead of a direct blow, and the very perfect discharge of these mills, specially adapts them for the fine crushing of ores, with the making of very much less slimes than I have ever seen produced by any other methods, and of course the general degree of fineness can be regulated by the screens, as with stamps.

The sand produced by crushing with them, using say 200 holes to the inch screens, is then readily and easily handled by Frue vanners, two Frues to each 3½-foot mill, and where very close work is required, these Frues to be fixed tandem, or head to head, the pulp to be delivered to them from the mill by an overhead Spitzcasten, the Frue nearest the mill taking the coarser part of the pulp, while the finer slimes pass on to the other Frue, the conditions of working, *i. e.*, speed, quantity of clear water, etc., on the two Frues being slightly altered to suit the different class of sand treated by each.

Such a plan carries out pretty well in its entirety what should be one of the fundamental principles of all ore-dressing—that of *sizing before concentrating*.

It is, I grant, somewhat expensive to install all in the first place, but once put in is almost automatic, one man on each shift being able to look after say six mills, while another on the lower floor can as easily look after 12 of these machines.

To quote from my own experience, I have for the past 18 months been running a plant consisting of two 3½ foot and one 5-foot Huntington mill on ore consisting of about equal parts of very hard and very soft stone, containing very fine gold and carbonate of bismuth. The rock that is worth concentrating is classified at the mine, sent to one of the 3½-foot mills, is generally the softer and more decomposed portion, and runs, as delivered in the ore bin, from one-half to one per cent of a friable, earthy carbonate of bismuth, an ore that under the stamps would give 75 per cent of slime. As the gold is fine and has to be saved, before concentrating the bismuth I use screens of 225 holes per inch, and yet the product delivered to the Frues does not run more than ten per cent of actual slimes, the balance being delivered in the even, rounded grains, peculiar to the product of these mills.

The tailings show only the merest traces, while the product runs from 12 to 25 per cent, and can be worked much higher by further treatment.

In some future letter I will, with your permission, have something to say as to the merits of Huntington mills as gold-savers, for I feel assured that these mills only require to be better understood to be more generally adopted.

Health of the State.

How to Avoid a Cholera Plague.

The report of the State Board of Health for the month of June shows that there were 1021 deaths in this State that month, giving a death rate of 1.29 per thousand for the month, or 15.48 per annum. Of these 136 were due to consumption, 58 to pneumonia, 24 to bronchitis, 5 to congestion of the lungs, 17 to diarrhea and dysentery, 33 to cholera infantum, 63 to other diseases of the stomach and bowels, 22 to diphtheria, 7 to croup, 14 to scarlatina, 7 to measles, 5 to whooping cough, 14 to typhoid fever, 3 to malarial fevers, 8 to cerebro-spinal fever, 1 to erysipelas, 34 to cancer, 89 to diseases of the heart, 6 to alcoholism, and 475 to other causes.

The record shows that June was comparatively a healthy month. The death rate per thousand was 1.29, against 1.47 in 1891. There is shown an increase of diseases of the stomach and bowels, but that is expected in summer, when the fruit ripens. Cholera infantum is more frequently fatal during the warm weather. Those diseases which increase the mortuary reports of the winter continue to abate. Smallpox is not reported at all. It is, however, reported epidemic at Washington, B. C., and, although Oregon and Washington lie between us and that point, it may very soon be necessary to place an inspector at the northern boundary of the State to detain any persons showing symptoms of the disease.

The report deals at some length with the onward march of cholera and the futility of trying to guard against it by quarantine only. Common prudence, it says, would dictate immediate attention to private and municipal sanitation, as the dreaded plague can usually be halked by the absence of a polluted soil to breed in and spread from.

World's Fair Notes.

San Bernardino county is contemplating the making of a native salt palace for the World's Fair, using blocks of crystallized salt that measure 12x24 inches, and are perfectly transparent.

The County Board of Education of San Diego County has adopted a resolution providing that October 12th next be observed in the public schools throughout the county in commemoration of the discovery of America by Columbus.

Reviewing the State as a whole, there are 40 counties out of a total of 54 that are engaged in preparing exhibits of their products for the World's Columbian Exposition that opens at Chicago on May 1, 1893. A few of the counties that are at work have not formed local World's Fair Associations, but such counties are included in one of the three district associations in the State, and the preparation of exhibits is in progress through other organized bodies or through prominent individuals. In 32 counties of the 40 there are regularly organized World's Fair Associatioos, and with but few exceptions the collecting and preparing of displays is proceeding systematically and with a satisfactory degree of rapidity.

The Los Angeles World's Fair Committee has prepared a plan of cases for making an exhibit of curios at the World's Fair. The cases occupy a floor space of 20 by 40 feet, the center one being 10 feet high, 30 feet long and 10 feet wide. This is surrounded by counter showcases resting on a three-foot counter, where an attendant can stand as bodyguard over the cases. The cases will be nickel plated, the estimated cost thereof being between $700 and $1000. The committee on a nut exhibit has arranged a plan for a pyramid of glass showcases, covering a floor space of ten by ten feet. On top of the pyramid will be a glass column 15 feet high surmounted with a glass urn. The cases are to be filled with walnuts, the display of grade and quality being made from a front view of the cases, the column being the ornamental feature.

MECHANICAL PROGRESS.

Compounding Locomotives.

The Master Mechanics' Association has recently held its annual session at Saratoga. The master mechanic of to-day is a man intrusted witb great practical responsibility in the mechanical matters of railroad operating, and be realizes that it is better to go slow than go wrong. At the meeting referred to, this was particularly noticeable in the discussion of compound locomotives, of which the *American Machinist* has the following to say:

It is but a short time since compounding has received attention from railroad men. The utility of the compound condensing engine had been strongly disputed, and the war against noncondensing compounds had been more fierce. This was about the status of tbe case when compounding was introduced on some of the railroads of Europe. It had been settled that compound condensing engines were valuable in an economical sense, but the advocates of simple cylinder engines had by no means, and have not yet, given up their contention that there could be no economy in a compound noncondensing engine. It is the trial of these very same noncondensing engines on railroads that brought out, at Saratoga, what was probably the most interesting discussion that was ever had by a body of mechanics in this country.

A committee of master mechanics had been appointed to report upon compound locomotives from tests actually made, and this committee presented a report involving an immense amount of labor. It was the consideration of this report that afforded an opening for tbe able debaters of the association. The committee did not put an exaggerated estimate on its work, and evidently expected it to be criticized by those who had superintended the operation of compound locomotives on the roads under their charge mechanically.

It may seem at first thought, even to mechanical engineers, that the settling of the question of the economy as between a simple and a compound locomotive would be an easy matter. If the determination of this was between two stationary steam engines used for ordinary purposes, the matter would be comparatively simple; but the difficulties of determining the comparative efficiency of two simple locomotives is nearly insurmountable. In point of fact, the actual economic performance of a locomotive working under any conditions has not yet been determined to that degree of exactness that give to the conclusions any of the value of scientific exactness. When it comes to comparing the efficiency of two engines, one a compound, tbe difficulty can hardly be overestimated.

Some of the difficulties may be briefly stated: The run must be made under the ordinary requirements of every-day work. Considering this, it will be seen that the coal must be used as it is used in common practice, and this means an "estimate" at stopping and starting that may be wrong to the extent of a large percentage, considering the capacity of a locomotive fire box. This is one way in which the "estimates" may be widely astray. Then the power must be measured if that plan is adopted, and with the speed of a run varying from nothing to the maximum this is no easy matter; in fact, it is a very difficult matter.

It is for comparatively short intervals of time that tbese calculations must be made, and the probable errors—one of which cannot he calculated upon to counterbalance, in any degree, the other—lead to a distrust of such a method. But even if this was admitted as satisfactory, it would cover only one set of conditions that might be varied on every run. This has led to the very unsatisfactory expression of "train mile" and the like.

It might seem that the proper way to measure the efficiency of a locomotive was by the water used per horse power developed. This is fairly susceptible of measurement, but with the present practice of "picking up" water an element of difficulty is introduced. But assuming that the water used could be accurately measured, this does not cover the question as between simple and compound locomotives, not even if the power developed be accurately measured, for the advocates of compounding claim that the more desirable effect of the exhaust is responsible for a good deal, or all, of the advantages of the compound over the simple locomotive; that is, that the easier exhaust of the compound makes the boiler in effect a larger one, in that steam is generated with less waste of fuel. There is reason in this, because it is well known that, measured by ordinary practice, the locomotive boiler is overworked, and that by the sharp lifting character of the exhaust from the cylinders of the simple engine the fire is destructively disturbed.

There are, it must be admitted, two divergent opinions, one being that by the saving of steam in the cylinders the boiler is made comparatively larger, and hence is worked with better economy. Another is that there is no appreciable saving in steam in tbe cylinders, but that tbe way it is used brings about economy in its production.

Tbe foregoing are only a few statements of the difficulties in the way of a comparative test of compound and simple locomotives. To these might be added the opinions that compound engines should be made for special rather than for general purposes, and the consequent reason for compromising for the variations incident to railroad traffic, and, per contra, that no such allowance should be made; also that there are differences in the boilers in the two types of engines, and various other differences. Altogether it is no wonder that the committee failed to arrive at a definite conclusion, and that the spicy discussion was evolved,

Magazine Guns.

While the Magazine Gun Board is concluding its tests of submitted weapons at Springfield, it is interesting to notice, says the *Army and Navy Register*, that Mr. Very, of tbe Hotcbkiss Ordinance Company, whose residence in Europe has afforded him ample opportunities of watching the ravages of tbe magazine guns epidemic, believes the Springfield single loader is the superior of any of the magazine guns. Undoubtedly half a dozen shots, or whatever the magazine holds, can be fired more rapidly from a magazine gun than from the Springfield rifle. But Mr. Very judiciously observes that the critical period, during which a great rapidity of firing will be important in battle, will last tbree or four minutes, and a soldier can fire more shots in three or four minutes from a Springfield single loader than he can from a magazine gun. Mr. Very also makes the curious but important criticism of the magazine guns, that no soldier in the excitement of combat will count off his shots, and that he will go through the motions of firing at an advancing enemy after he has exhausted his magazine. Even in practice and target firing he believes that most soldiers fire once more than they have cartridges, and amid the noise and excitement of battle, especially in the face of a charge from the enemy, he believes that a large portion of the troops would forget all about the magazines and go on automatically with the motions of loading and firing. Most of the officers of companies that were a few years ago supplied experimentally with magazine guns reported adversely on them. They have with them a careful and intelligent observer fresh from the continent, where all armies are equipped with magazine guns. The investigation now going on is of exceptional thoroughness, and the report of our Small Arms Board will be of great importance; it will probably be conclusive.

LOG-HAULING. — A pulp-manufacturing concern in New York State is employing a very practical and ingenious method of inclined and horizontal log-hauling. The apparatus consists of two sprocket wheels, over which pass an endless detached chain running in a recess at the bottom of a trough and provided at intervals with log teeth. The head wheel is 25 feet above the foot wheel, and the head end of the chain swings and can be raised or lowered to suit the depth of the water. The logs are floated to the haul-up, and as they come around the foot wheel are caught by the chain teeth and carried up the incline at the rate of 25 feet a minute. On arriving at the top they are discharged into a horizontal log haul having head and foot wheels nearly 600 feet apart, the whole being similarly constructed to the inclined haul, the return chain supported by tooth idlers, and a deflecting piece is placed across the horizontal conveyer, by which the logs elevated by the chain are thrown out of the trough and rolled over the side upon long skids. By this arrangement the use of eight or ten double teams and as many men are dispensed with. Some of the logs measure 30 inches in diameter and 50 feet in length, and a 25-horse power engine is found ample for the purpose.

TOOL-SHARPENING BY ACIDS.—It has long been known that instruments and tools, such as knives, shears, scythes and files, which have become blunt by use, may again have a keen edge imparted to them by means of acids, as well as by the common methods of sharpening and whetting. But so far the less usual process does not appear to have met with the favor which its merits deserve. All dilute mineral acids are adapted for tool-sharpening: for example, 10 parts of sulphuric acid hydrate to 100 parts of water. The desired end is more quickly attained if a portion nf the sulphuric acid is replaced by nitric acid. A suitable mixture is: 1 litre of water, 50 grammes of Chili saltpetre, and 60 cubic centimetres of concentrated sulphuric acid. This compound dissolves 1½ grammes of metal within ten minutes from an iron surface of one square centimetre; dissolution is slower where sulphuric acid alone is used. Steel is acted upon in the same manner as iron, with the exception that the process is not so rapid because of the polished surface becoming covered with a thin deposit of separated carbon. It has been sought to strengthen the action of the acids, or, in other words, to shorten their period of action, by attracting the electric resistance of the acid with gas-retort coal or with other metals; but up to the present no substantial advantage has accrued from this method. In order to secure as uniform an acid action as possible, preliminary cleaning of the metallic surfaces, preferably with a soda solution, is recommended.—The Age of Steel.

SCIENTIFIC PROGRESS.

Magnesium Flashlight.

A magnesium flashlight for lighthouses is to be tried at Staten Island by the U. S. Lighthouse Department, says the *Engineering News*. The light is the invention of Prof. J. C. Schirm of Berlin, Germany, and has been tested at Hamburg, where, it is said, it was visible for six miles with the sun shining. The apparatns is 6.56 high and 3 feet diameter. Inside is a bellows through which benzine gas is led, while air is forced througb pumice stone, strongly impregoated with benzine. This benzine gas is then passed through finely powdered magnesium, and passes out of an upright pipe through a small flame, by which it is lighted, and where it develops such an intensity that the apparatus shows a luminosity of about 400,000 c. p. The apparatus is regulated by clockwork. The consumption of magnesium is very small. If a power of 200,000 to 400,000 c. p. is desired, only 0.6 to 1.5 grains of magnesium powder are required. The consumption is from 22 to 55 grains in ten hours, representing a cost of $1.50 to $2.50. The apparatus is not necessarily used with condensers or other optical arrangements or reflectors. If, however, lenses be used, the brilliancy is greatly increased. The great advantage with this light is its ability to penetrate almost opaque atmosphere to a greater extent than any other light heretofore produced. This is a property that is almost lacking in the electric light.

It is estimated that a light of about 80,000 c. p., producing six flashes per minute, would cost $1.68 for ten hours' maintenance. The apparatus itself requires a floor service of five feet square. Observations on apparatus set up at Bremen, Bremerhaven and Hamburg are said to have verified the strengtb of the light and its power to penetrate very heavy fogs. The light at Bremen was observed for 70 miles and gave the appearance of lightning on the northern horizon. The observer could give exactly the intervals at which the flashes followed each other.

Magnetic Iron Rust.

The London *Journal* notes that at the recent meeting at Hobart, Tasmania, of the Australasian Association for the Advancement of Science, Prof. Liversidge, F. R. S., of the University of Sydney, read a suggestive paper on the rusting of iron. The author remarked that in books upon chemistry it is usually stated that iron rust is composed of the hydrated sesquioxide of iron; but on examining a very large number of specimens of rust from many different places, and from iron articles of various kinds, and formed under very varied conditions, Prof. Liversidge has found that in almost every instance the rust contained more or less magnetic oxide. Indeed, in some cases the rust, altbougb presenting the usual rust-brown color and appearance, was, when powdered, practically altogether attracted by the magnet. The specimens of rust whicb first drew the author's attention to this subject were large rust scales obtained from some old tramway metals, which he was led to collect and examine on account of their resemblance to the crust so often present upon metallic meteorites. On crusbing these scales in a porcelain mortar, and testing the dust with a magnet, it was found to be wholly susceptible to magnetism, owing to the small quantity of magnetic oxide present being mechanically inclosed in the rust particles. The production of this magnetic oxide does not seem to have been due to the presence of mill scale, because when bright iron wire, plates, rods, nails, etc., were artificially rusted in many ways with free access of oxygen, in almost every instance a large amount of magnetic oxide was formed. These observations have some practical bearing upon the problem of the preservation of wrought iron structures from rust.

Nonluminous Fuel Gas.

At the last annual meeting of the Western Gas Association, held at Detroit, Mich., Mr. K. Mitchell, of St. Joseph, Mo., read a paper in which he held that there can be notbing done by fuel water gas that cannot be done by the illuminating gas now at hand. One of his arguments against fuel water gas was its lack of odor, which makes the detection of a leak almost impossible. Mr. Mitchell's conclusions are thus criticised by *Light, Heat and Power:* In the first place, it is a matter of slight difficulty to odorize the blue gas. Much of the opinion to the contrary comes from the fact that when this gas was being made at the old Citizens' Works at Lynn, various expedients were resorted to for this purpose, the majority of these being soon rejected as impracticable or too costly. This search for an odorizer arose from a supposed necessity of a patent right obligation and not from any impracticability in the most common method of odorizing. If the fuel gas made at St. Joseph is not odorous, the fault lies with its makers, and, though it will be hard to convince the consumer of any philanthropic purpose on the part of the gas company, should be remedied. With the ease of its remedying, the argument of danger in use falls to the ground.

The heat unit question, of course, is one of importance. Accepting the figures quoted from Dr. Love, showing an efficiency of a little more than two-fifths for the fuel gas, as compared with the coal gas, it seems to naturally follow that tbe fuel gas must be sold at ratber less than this ratio to render its use economical.

In the comparison of costs between heating by coal and heating by fuel gas, Mr. Mitchell takes the price of the gas as sold at retail in St. Joseph—50 cents per 1000 ft. This gives the total cost of gas service as $658.70, against $390 for the correspooding coal service. If the gas be taken at 30 cents per 1000 ft., the former figure shrinks to $429.42, a difference of 10 per cent in favor of coal; while at 25 cents per 1000 ft., the balance turns and the cost becomes $372 10.

We make the calculation upon these bases, because, if noncarbureted water gas, or a nonluminous or slightly luminous gas is to be the gas that shall be sold for general fuel purposes, it must be and will be sold in localities like St. Joseph for not more than 25 cents, net. We do not believe—nor does any one else sincerely think—that a higher rate than this can be successfully maintained. From the state of the art in general, we doubt the saving of the degree of efficiency claimed by the fuel gas advocates, and we have little doubt but that, in their push for business, they have much neglected the sanitary problem.

There is more to be learned in the matter of gaseous fuel than is yet known, but if a nonluminous gas is to be tbe coming fuel, it may be considered as settled tbat :

It will be freely odorous. This is a condition of convenience and popularity.

It will be sold at 15 cents per 1000 ft., or less. That is a condition of necessity.

THE earth passes through the zone of shooting stars, if it may be so called, each year on the 10th of August, and on that night and the two following, if the weather is clear, the observer may count them by the hundreds. These all come from the constellation of Perseus, says Camille Flammarion. "The fact that the earth takes three days to pass through the shower of shooting stars affords a measure of the vast space they occupy," he continues; "the more so as they cross an orbit at right angles to the earth's course. Their orbit is a long one and corresponds with that of 1862."

THE Neuenkirchen method for consolidating shifting sand in water-bearing strata consists in injecting powdered cement, by means of compressed air, steam or water under pressure, into the ground to be consolidated, says the *Colliery Guardian*. The cement is screened in order to free it from lumps and foreign substances, and the powder is taken by an injector, which forces it through a flexible pipe into a perforated tube sunk in the soil to the required depth.

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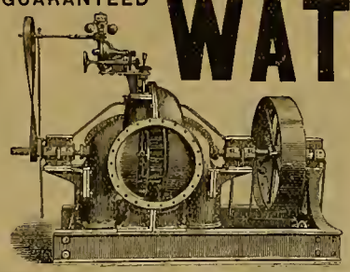

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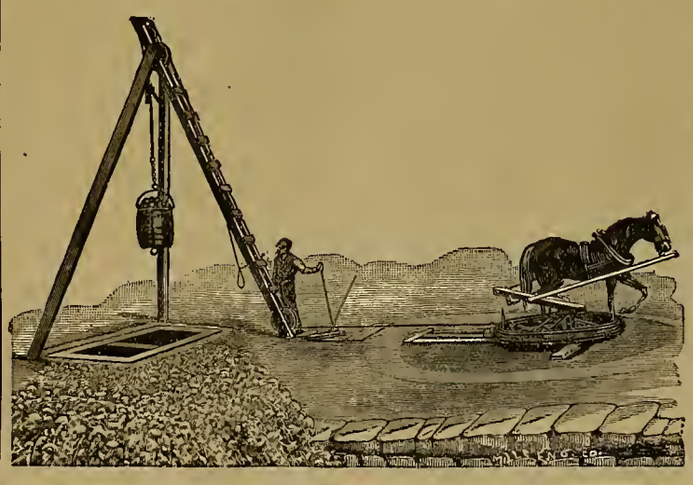

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FOR THE HALF YEAR ENDING JUNE 30, 1892, A dividend has been declared at the rate of five and one-tenth (5 1-10) per cent. per annum on Term Deposits, and four and one-quarter (4¼) per cent. per annum on Ordinary Deposits, payable on and after FRIDAY, July 1, 1892.

GEO. TOURNY, Secretary

ELECTRICITY.

Electric Tricycle.

The *Revue Industrielle* says that, after a good many trials, a very light and simple tricycle has been made, propelled by electricity. The tricycle is of the ordinary sort, but the saddle is removed, and replaced by a box, the top of which forms the seat for the traveler, while the interior contains a chromic-acid battery and an electric motor, the power from which is transmitted to the driving-wheels by means of cog-wheels and chains. The steering head is controlled by a sort of tiller, and the brake is managed by the feet. The battery is double, composed of two batteries of 18 cells each, connected for intensity, the two separate batteries being then connected for quantity; but this arrangement would naturally be modified to suit the kind of motor used. As with the ordinary tricycle, the electric vehicle is supplied with ball bearings. Including the battery, with cells filled with liquid, the whole machine ready for starting weighs only about 175 pounds, and can carry two persons of average weight over an ordinary road at a speed of 12 miles an hour for three or four hours. At this time the battery declines considerably in force, but will continue to furnish a diminishing power for some time looger. The cost of power obtained from a battery of this sort is considerable. Roughly speaking it would amount to about two cents a mile for materials alone, exclusive of the labor of refilling and renewing the battery. As cyclers would rarely be able on their journeys to stop every four hours and replenish their supply of chromic acid at a village store, we imagine that this mode of locomotion will not be generally adopted at present, and, although the account says nothing about the effect on the ironwork of the machine, or the trousers-leg of the proprietor, of the upsetting of the battery by a sudden jolt, there is reason to suppose that it would be quite deleterious, so that most of us will prefer to wait, before having our wheels supplied with electric motors, until that good time shall arrive, which is probably not so very far off, when light, constant and powerful storage batteries shall be our constant companions, and electricity for charging them shall be "on tap" at every postoffice and corner grocery.

Atmospheric Electricity.

In 1752 Lemonnier observed that the atmosphere usually was in an electrical condition. Cavallo, Beccaria, Ceca and others added to our knowledge of the subject, and more recently Quetelet and Sir W. Thomson have generalized from more careful observations. The main result is that the air above the surface of the earth is usually, during fine weather, positively electrified, or at least that it is positive with respect to the earth's surface, the earth's surface being relatively negative. The so-called measurements of "atmospheric electricity" are really measurements of difference of potential betweeo a point of the earth's surface and a point somewhere in the air above it. In the upper regions of the atmosphere the air is highly rarified, and conducts electricity as do the rarified gases in Geissler's tubes. The lower air is, when dry, a nonconductor. The upper stratum is believed to be charged with + electricity, while the earth's surface is itself negatively charged, the stratum of denser air between acting like the glass of a Leyden jar in keeping the opposite charges separate. If we could measure the electric potential at different points within the thicknesss of the glass of a Leyden jar, we should find that the values of the potential changed in regular order from a + value at one side to a − value at the other, there being a point of zero potential about halfway between the two. Now, the air in fine weather always gives + indications, and the potential of it is higber the higher we go to measure it. Cavallo found more electricity in the air just outside the cupola of St. Paul's Cathedral in London that at a lower point of the building. Sir W. Thomson found the potential in the island of Arran to increase from 23 to 46 volts for a rise of one foot in level; but the difference of potential was sometimes eight or ten times as much for the same difference of level, and changed rapidly as the east wind blew masses of cloud charged with + or − electricity across the sky. Joule and Thomson, at Aberdeen, found the rise of potential to be equal to 40 volts per foot, or 1.3 volts per centimetre rise of level. During fine weather a negative electrification of the air is extremely rare.—Electrical Age.

THE fact that electricity, like heat, light and radiant chemical energy, is a manifestation of energy, has long been known, but up to the last four or five years scientists have been uncertain as to the manner in which energy existed in the electric current. The old idea of an electric fluid, which is still prevalent outside of scientific circles, served to mislead investigators. At present, however, the researches of such scientists as Hertz, Lodge, Crookes, Sir Wm. Thomson and Tesla seem to have established the fact that electricity, like heat and light, is merely a vibration in the so-called "ether" which is believed to permeate all space. It is notable that all the original theories as to what we now call forms of energy, were materialistic. The Newtonian (corpuscular) theory of light, which was the generally accepted one for half a century, was that light was an efiect produced by an incessant fire of infioitesimal but material cannon-balls thrown off in all directions from the light-giving body. Heat was a material something stored in the pores of the visible body. Electricity was a "fluid." All these assumed material substances have been shown to be non-existent, and not necessary to explain the phenomena. But there still remains one grave difficulty with the later theories. The notion of a material ether itself is almost as contrary to what we know of the nature of other matter as the corpuscular theory of light, and almost as much a mere evolution of the scientific inner consciousness, to explain what is otherwise inexplicable. We have not a particle of direct evidence to prove that there is a substance with properties such as we assign to this ether. We have only to eliminate the notion of a material ether, as we have eliminated the notion of material light particles, and we shall be down to hardpan. "I believe because it is impossible," the old monk declared. The modern scientific man, possibly, would do well to reverse this logic and declare: I disbelieve because it is so convenient a theory, with nothing but its convenience to support it.—Engineering News.

THE lead mine at Metteroich, in Belgium, is not only lighted by electricity, but the current is utilized in all kinds of work. The daily quantity of mineral extracted is 3000 tons, and the works operated automatically are so numerous that 25 men are sufficient to do the work. Ooe of the applications of electricity in this mine is new—at least we have not heard it spoken of until now. Each bucket that arrives at the top of the shaft makes an electric contact, and a needle in the office makes a red line upon a band of paper, which is turned by clock movement. This arrangement allows them to keep an account of the regularity of the work, and the number of buckets registered prevents any dispute.

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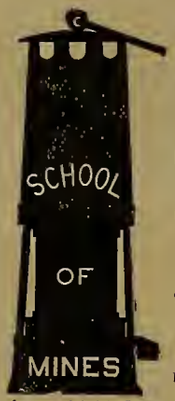

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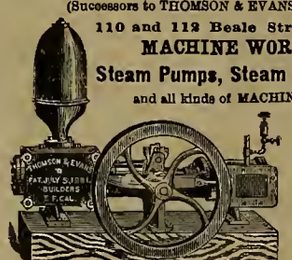

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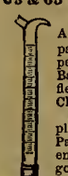

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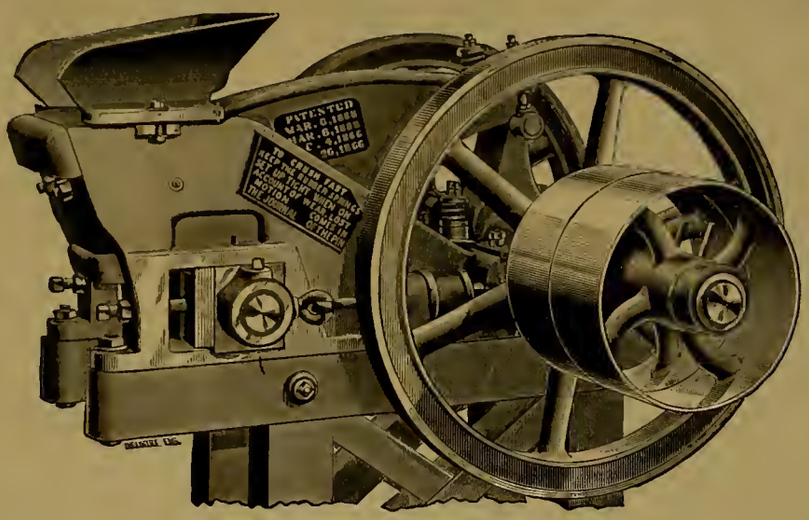

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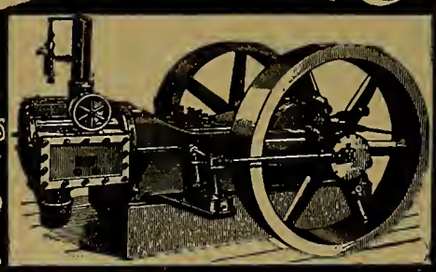

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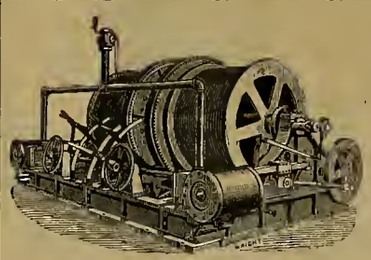

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USEFUL INFORMATION.

Photographs in Colors.

The method adopted by Mr. Ives for photographing in colors is, says the *British Architect*, another instance of American ingenuity. Acting on Helmholtz's theory, that the nerves of the eye respond to wave vibrations corresponding to light of red, green, and bluish violet, and that all tints are made up of combinations of these light waves, he takes three photographs of a scene or object, screening off from the first sensitized plate all but the red rays, from the second all but the green rays, and from the third all but the blue-violet rays. Then he places the photographs on celluloid obtained from these negatives in a three-lens lantern, and projects these so that they coincide in one picture, screening his lenses with glass of red, green, and blue-violet color. The result is a large photograph in all the actual colors of nature, both landscapes, photographs of pictures or of flowers. A still more striking effect is produced by placing the treble celluloid positives in a kind of stereoscope lantern with prisms, when the photograph of a geranium or other flower stands out with the vivid colors of nature. Of course Mr. Ives' results are very different from the colored photographs often put forward as examples of actinic power, but in which all colors but one are produced mechanically. It is remarkable that M. Lippmann, one of the professors at the Sorbonne, has also succeeded in photographing colors. At the last meeting of the French Academy des Sciences, he exhibited several examples of plates from colored objects, one being taken from the national flag.

MORDANTING WOOL.—The new method of mordanting wool, described at some length in the French journals, is claimed to possess some special advantages as compared with even the methods regarded ordinarily as the most satisfactory. The mordant, according to this description, may be chrome alone or chrome and iron; and from the formulæ given by the inventors, it appears that in the first case chrome alum is employed, and in the second a mixture of chrome alum with ferric sulphate. The peculiar preparation of these reagents constitutes the value of the method proposed. Chrome mordant is obtained by reducing the chromic acid in an alkaline chromate with bisulphite of soda in the presence of sulphuric acid. Thus 296 parts of bichromate of potash, 245 of sulphuric acid, at 166 troy weight, and 147 of bisulphite of soda give 393 parts of chromic sulphate and 174 of sulphate of potash. These two products make two equivalents of chrome alum, and the remaining parts represent a formation of sulphate of soda and water.

A NEAT invention by a Parisian has been applied to the fast express running between Lyons and Marseilles. Heretofore, the railway compartments were marked by numbers, and it was very difficult to see these at night. To find their respective compartments, passengers were compelled to impress upon their minds some unmistakable sign. Pictures of animals and of furniture, tools and weapons now serve as guides instead of numbers. The system has given great satisfaction, and has caused no end of merriment to passengers, who ride in a donkey car or a monkey car, as they style their compartments.

A MANSION in Ayrshire, England, has been fitted by a Paisley firm with an installation of electric light, the power being generated by a turbine running in connection with a six inch pipe having a fall of 27 feet. The water comes from a stream in the estate, and is stored in a dam. The turbine is belted to a dynamo which works in conjunction with storage cells. There are 50 lamps, nearly all of 16 candle power.

GOOD HEALTH.

Education and Vision.

There is no doubt that the weakening of our power of vision is mainly due to education. As M. Motais, of Anger, said in his paper recently read before the French Academie de Medecine, man in his wild state, roaming about open country or forests, is gifted with remarkably long sight. He has to scan the horizon in the dark or under the glare of the sun in order to espy both enemies and prey. Even races who have partly come under the influence of civilization, but remain in the open, such as the Arabs and the inhabitants of Northern and Asiatic Russia, possess astonishing powers of sight. They will describe a black speck on the horizon with peraccuracy to incredulous denizens of civilized States. Not only their comfort, but their very existence, depends on this power of distant vision. The same thing is observed with wild animals. All the larger species are remarkably long-sighted, for they, too, have to scan the distant horizon for enemies and prey, and judge distances, just like the savage man who disputes the sovereignty of the plain and forest with them. M. Motais was anxious to discover if the restricting influences of civilization would affect the eyesight of the larger beasts of prey. He found that the oldest animals occasionally lost their sight altogether owing to overconfinement, but that otherwise their long sight remained. But if the animals were caught young, and secured in the usual cages or dens, these animals having no opportunity of exercising their powers of vision over long distances and wide expanses, grew up short-sighted.—Optician.

Exercise Better than Medicine.

Much of the food actually digested and assimilated is not used to the fullest extent for want of sufficient oxidation to make it yield the greatest amount of vitalizing power to the tissues of the body. Such partially unoxidized products have an irritating effect on the organs and tissues, and predisposes them to disease if they do not directly affect them with it.

Exercise has a stimulating effect on all parts of the body by inducing further oxidation in all the tissues and organs. This increased oxidation is attended by a greater demand on the part of the system for oxygen—as indicated by the greater number, force and frequency of the respirations

During exercise the heart beats faster, and forces more blood through the lungs to all parts of the body, bearing in its little blood cells the precious life-giving factor, oxygen. These little cells—one constituent of which, hœmoglobin, has the wonderful faculty of quickly loading and unloading itself with oxygen—thus act as direct aids to the process of oxidation in the tissues and organs.

It is the combining of oxygen with unoxidized products in the blood that gives to each individual cell its possibility of sustaining life. Any process which increases the oxygen supplied to all parts of the body tends to strengthen the life in each individual cell, and to give it more power to resist disease.

Exercise of all factors does this most effectively, and besides actually producing in each individual cell a greater vitality, it gives a favorable opportunity for the waste products of the tissues to be thrown off rapidly. By thus causing a further oxidizing of certain matters in the blood, it conduces in a double sense to life and health.

Habitual outdoor exercise, with suitable protection from extremes of weather, is the most effective means of prolonging life to old age.—Youth's Companion.

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Notice—There are delinquent upon the following described stock, on account of Assessment (No. 4) levied on the 4th day of June, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
V. Oadesden	250	50	2 50
E. Clarke	15	20	1 00
E. Clarke	62	30	1 50
R. M Pogson	13	200	10 00
F. H. Abbatt	18	100	5 00
A. E. Mintie	49	1,000	50 00
A. E. mintie	138	1,000	50 00
A. E. Mintie	162	75	3 75
M. A. Carpenter	54	500	25 00
F. W. Spencer	230	2,000	100 00
F. W. Spencer	267	5,000	250 00
F. W. spencer	268	3,000	150 00
L. C Mintie	87	1,000	50 00
L. C. Mintie	139	1,000	50 00
L. E. winans	97	100	5 00
L. E. Winans	211	400	20 00
J. Schoo craft	110	50	2 50
J. schoolcraft	143	50	2 50
J. K Secord	112	500	25 00
M. Secord	113	500	25 00
J. H. Elwood	114	100	5 00
J. H. Elwood	115	100	5 00
J. H Elwood	116	100	5 00
J. H Elwood	117	100	5 00
J. H. Elwood	118	100	5 00
W. H. Brundidge	119	1,000	50 00
J. Morton	125	500	25 00
F. C Mintie	120	40	2 00
F. C. Mintie	137	10	50
W. L. Woodrow	128	300	15 00
E. H. Woodrow	129	100	5 00
C. Burchard	135	50	2 50
V. Neale	169	1,000	50 00
V. Neals	171	500	25 00
V. Neale	173	1,000	50 00
V Neale	174	1,000	50 00
V. Neale	175	1,000	50 00
Mrs. G. J. Koenig	169	1,000	50 00
S. A. Winans	191	1,000	50 00
W Lichtenberg	199	400	20 00
E. Mayo	246	100	5 00
W. M Pierson	257	250	12 50
R. B Mitchell	258	250	12 50

And in accordance with law, and an order of the Board of Directors, made on the 4th day of July, 1892, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 723 Market St., San Francisco, California, on TUESDAY, the second day of August, 1892, at the hour of 3 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

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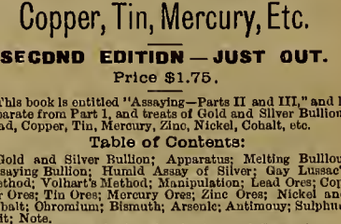

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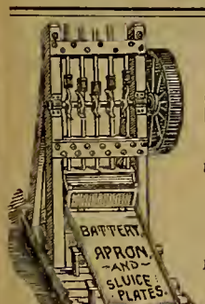

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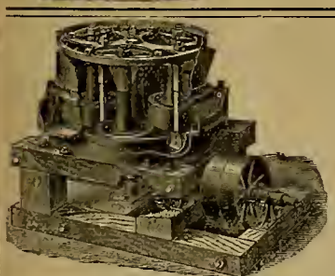

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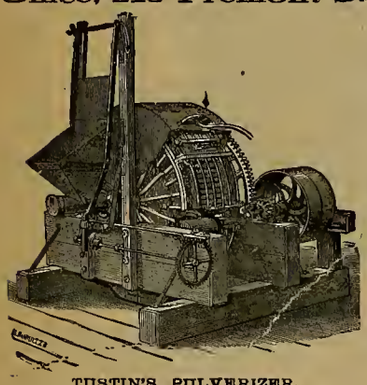

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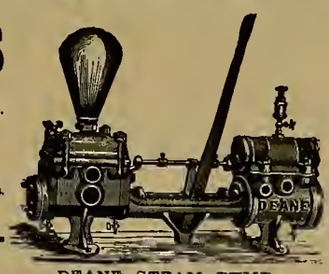

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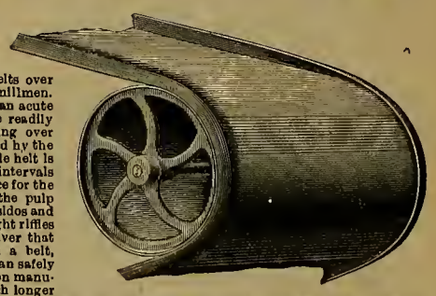

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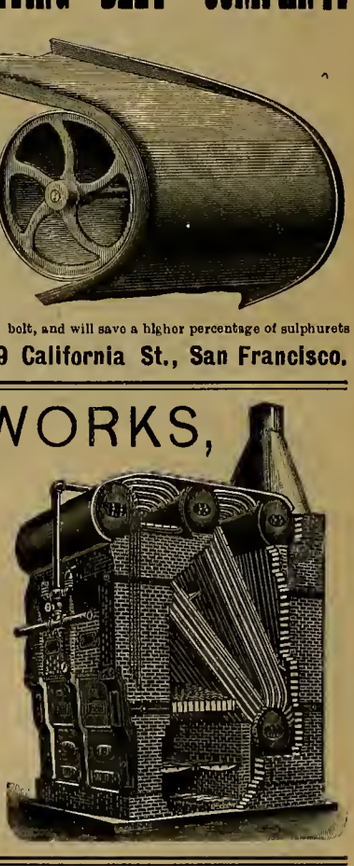

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MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

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Amador.

AT A STANDSTILL.—Amador *Ledger*, July 16: The feeble, half-hearted operations which have characterized the Plymouth Consolidated for a long time past, have come to a complete standstill. Nothing is doing about the mine, and even the taking out of water has been suspended. The mine is consequently filling up with water. The gravel claim at Oleta has come to a sudden halt. The works have been shut down, it is said, for three months. The Goodman mine, at Quartz Mountain, is idle again. It had just been started up, when the death of J. L. Goodman occurred, and the possibility of legal entanglements therefrom led to the shutdown until the title of the property is definitely settled. The Clinton Con. Co., or parties interested in that company, have bonded the old Pioneer and Grieshack claims, in pioneer district, and have started to work prospecting the same. We understand the amount for which they are bonded is $5000. J. R. Tregloan, Supt. of the South Spring Hill mine, says, in an affidavit presented to the Board of Equalization for a reduction of assessment on that property, that the total output of the mine for the past year was $65,300.25, and the operating expenses $79,453.86, showing a net loss of $14,153.67 for the year. The mine and improvements are assessed at $60,000.

WORK SUSPENDED.—Amador *Record*, July 16: Owing to the fact that the Goodwin mine property has been placed in the hands of administrators, work has been suspended altogether. W. G. Whorf recently took charge of the mine, which is located at Quartz Mountain, and the prospects for being able soon to employ a considerable force of men were said to have been flattering. The property is likely to lie idle for some time now, as it may require many months to get the estate settled. Last week the Wabash tunnel, near Amador City, cut a stringer of quartz varying from two to eight inches in width. In appearance it is the same as those encountered before, except that it is livelier in appearance and shows considerable sulphurets, as well as being quite rich in free gold. To all appearances, it is only a matter of a few days when the main ledge will be encountered, and the stockholders feel quite elated over the prospects and will push the work to completion. The work of sinking the Boss shaft at the Belmont mine is going ahead as usual, and they are nearing the 200-foot level. When that point is reached, crosscutting for the vein will begin. Last Monday was pay day at the mine.

Calaveras.

PROSPECTING.—Calaveras *Citizen*, July 16: Sheriff Thorn has been prospecting a batch of quartz from his Illinois mine and finds it well saturated with gold and also extremely rich sulphurets. The shaft is down 100 feet, and gold can be got anywhere in it, the vein being more than five feet in width, and expert miners who have worked in it think well of the prospects for a paying mine; and if worked by intelligent, reliable and experienced management, could be made a paying gold producer. Yet the old adage often comes true that a poor manager often spoils a rich mine, while an able manager will make a poor mine pay and make a rich property. A whim is being erected over the new discovery claim near Copperopolis, one of the Pine Log group of mines, which was found some months ago by expert Brown, and the prospects are all that were predicted for it. The shaft is on the borders of the Justice gold mine and the Royal, and will be sunk 100 feet. Every pound of ore has gold and sulphurets, the vein being over 30 feet wide.

El Dorado.

GENTLA ANNIA.—*Republican*, July 16: The Gentla Annie mine is developing in fine shape, and a large body of good rock has been opened below the tunnel. In driving the tunnel, it cut off a small portion of the upper part of the deposit, leaving a narrow ledge of good rock in the bottom. A shaft was sunk in this tunnel on the vein, which gradually widened till in places it is eight feet across. An upraise has been made vertically to the surface over the shaft, and hoisting works are now being erected to raise the ore to the level of the tunnel, whence it will be run into the mill. On the surface, the Gentle Annie was made up of a large number of quartz seams that seem to have consolidated as depth was reached. A number of other mines in the same belt present this appearance, and it is a matter for congratulation that the developments so far made in the Gentle Annie are such favorable indications of their increased value when worked to the proper depth.

SPECIMAN.—Will Wilkinson made a lucky find one day last week on what is known as the Kennedy place, owned by his father, in the northern part of Placerville. He had been irrigating, and the water had cut a little channel through the soil, in which numerous pieces of float quartz were exposed. While examining these, Will discovered a piece sticking in the hard dirt that excited his curiosity, and, prying it out, he immediately perceived by its weight that it contained gold, and, on washing it, he found that it was almost solid metal, weighing about two ounces and being worth about $30. It is a very nice specimen of pocket gold. There are a number of pocket veins crossing this part of the city limits, and the ravines have contained large quantities of quartz gold. Will has been prospecting one of the seams, and found a pocket on it containing about $30. The piece he found last week was on a level piece of ground, about a foot from the surface, where the soil was about two feet deep. It is not likely that it had moved a great distance from the vein in which it was formed.

Humboldt.

AN OIL WELL.—Cor. *Western Watchman*, July 16: I visited the famous oil well last Saturday. Mr. Gilfillan showed us specimens of the various kinds of rock through which they had drilled. He says he thinks that in going down a distance of 400 feet, they passed through about 50 strata, all of which are hard and flinty and some showing undoubted evidence of silver. The boring continues both night and day. We were entertained with noting the sand brought up, for they are now down a depth of 1100 feet.

AN IRON MINE.—Humboldt *Standard*, July 16: A. W. Anger of Arcata informs the *Standard* that he is prospecting on a ledge of iron ore about two miles from Arcata, and he thinks with the prospect of opening a valuable mine of the finest quality. Specimens of the ore have been sent to the State Mineralogist, who pronounces the ore to be red hematite. He has tried the vein some 200 feet, and it is from six inches to three feet thick, between walls of very hard rock. Should this prove to be a mine of red hematite of sufficient proportions to pay for working, it will add great value to the productions of the county.

Napa.

CUT THE LEDGE.—*Calistogian*, July 16: The lower tunnel of the Knapp Consolidated mine has been advanced 430 feet, and is cutting the ledge obliquely. The rock formation and character of ledge matter are the same as found in the tunnel 150 feet above, which fact is deemed important. Yesterday the ore vein had not yet been cut through. The ore is of very good quality thus far, though better is expected before getting through the vein. Assays are from $15 to $100 per ton of ore. The finding of good ore in the tunnel—which, however, was confidently expected by those interested in the work—insures the advancement of $35,000 more for expenditure on the property. Ben Simmons exhibited specimens of silver ore in town the other day, which had been taken from the Sunnyside claim. He stated that he had been working alone in the tunnel and had cut the vein which had previously been drifted for. It appears to be a prospect worth following up. P. H. Flynn occasionally brings ore to town from the Leopard claim and its extensions in the hills two or three miles northwest of town. He says he has a mine, and will startle the natives, one of these days, with the developments that will he made there.

Plumas.

THE SHENANDOAH.—*National Bulletin*, July 14: From Mr. Whiting we learn that a force of 15 men is now working at the Shenandoah mine. A ditch 1½ miles long is being dug to enable the company to utilize the waters of Mill creek—a fine water privilege the year round. It will be used to run the mill and for mining purposes generally. The mill erected last year will be moved up to the mine, thus saving the cost of hanling ore, which will be dumped into the mill from the mine. Development work continues and with good prospects.

FINA NUGGETS.—From Assessor Sutton, who returned from Mohawk yesterday, we learn that, about ten days ago, Chas. Smith, better known as "Yorky," found a 38-ounce nugget in his mine above old Jamison City. He immediately cleaned up his sluice boxes, from which he obtained about $100 more, went to Downieville, sold his gold, and now is as happy and well dressed as a prince. In his claim, between the head of Squirrel creek and the head of the East Branch of Nelson creek, Ben. Jones found a $600 nugget last week, and he also is happy.

San Benito.

COAL PROSPECTS.—*Advance*, July 15: Upon his ranch on the Cienega road, Mr. D. J. Watson is engaged with a force of men mining for coal. Some time ago he discovered a small vein of coal in one of the gulches on his place. The vein at the surface of the ground was one inch in width. At six feet the vein widened to 20 inches; at 60 feet the vein measures four feet. A shaft is being sunk preparatory to running a tunnel into the hill. Mr. Watson proposes to prospect the property with his own capital. If coal is found in any quantity, a company will be formed to mine and market it. The coal has been tested in some of the local blacksmith shops. It is found to burn freely, but leaves too large a proportion of clinkers. This is due to the presence of sulphur in the croppings, and it is anticipated that when the mother vein is reached, all traces of the sulphur will disappear.

Shasta.

IRON OAA.—Redding *Free Press*, July 16: Last week we had an item relative to the shipment of iron ore. This week we interviewed J. M. Vannoy on the subject, and from him learned the following facts: Several years ago Mr. Vannoy, during one of his prospecting trips, discovered an extensive iron deposit near the gray rocks on Stillwater, one mile above the ranch of J. D. H. Williams, and some twelve miles from Redding. Not long since Mr. Vannoy brought to the notice of the Pacific Rolling Mills of San Francisco his discovery, and as they desired to test the ore, an open cut was made for the purpose of taking it out. Out of this cut, which is but 20 feet long, running from 2 to 3 feet in width and 7½ feet from the surface at the farther end, some 17 tons of ore, going as high as 73 per cent iron, were taken, and we are told that the ledge is opening up in fine shape. There are thousands of tons in sight. Jim Eligh and Preach Ten Eyck did the hauling, and a carload was shipped this week. If this test is satisfactory, the Pacific Rolling Mills will require hundreds of tons.

MINING NOTES.—Some rich ore has been discovered in the Little Nellie mine, assaying over $200 to the ton. The Longfield mine, formerly the Minnesota, located near the Little Nellie on Iron mountain, has discarded a patent pulverizer and will put in ten stamps. We learn that the mine is owned by Chicago parties, and that considerable development has been made. The Shasta Gold Extraction Co. received several lots of ore this week. The samplings proved satisfactory to the miners. There is now no excuse for miners who hold good claims for allowing themselves to lie idle, as the Shasta Co. will buy all that comes and pay the coin for it. There is nothing that has attracted the attention of mining men to Shasta county more than the Calumet Co.'s taking hold of the cyanide process and building it up into practical importance, for every two or three days from one to three men come up on the train and go to the Calumet and Shasta mills to investigate the process. During the past week the mills have been visited by parties from Montana, Washington, Southern California and Nevada. J. H. Morton has been experimenting with the MacArthur-Forrest process and has come to the conclusion that it is the proper process for the Old Diggings district ore. Mr. Morton thinks that the cyanide should be used homeopathically—that is, in a weak solution, just of sufficient strength to extract the gold from the sulphurets. A strong mixture seems to bring into solution the other minerals with the gold and makes the precipitate a conglomeration of metals from which the gold must be separated, whereas the weak solution attacks the gold alone and the precipitate is of greater value. More time, however, is required by a weak solution.

Sierra.

PAYING HANDSOMELY.—*Mt. Messenger*, July 16: The gold yield of the Bald Mt. Ex. drift mine for June was near $13,000. The cleanups for the past six months have aggregated $69,525.40, among which were nuggets varying from one, three, five, ten, twenty-two and thirty-five ounces. The regular monthly dividend, No. 20, of $6000 was declared for the stockholders, July 2d.

NEVADA.

Hawthorne District.

IMPORTANT STRIKES.—Hawthorne *Bulletin*, July 15. Important strikes are reported in the southwestern portion of Hawthorne district. Last week Thomas Jaggers sold a two-third's interest in the Oro Blanco to A. W. Curtis, J. R. Knowles and A. S. Dickerson, and work was at once begun on the mine. The pay ore is about six inches wide and is rich in gold. The Queen Isabelle is probably the best mine in that portion of the district at this time. The ledge is three feet wide, all milling ore, with very rich spots all through it. The working force will be increased this month. Many new locations are being made and it is not unlikely that this will soon be the busiest portion of the district. The new diggings are about 12 miles southwest of Hawthorne. S. L. Hanak of Salt Lake has been inspecting mining property hereabouts for the past two weeks. It is probable his company will make some important purchases in the near future. On Sunday Mr. Hanak visited Garfield with a view of purchasing the tailings of the Garfield Co. Peter Hatton and Charley Box are taking out some good ore from their claim near Alum creek. They will make a shipment next week to the arrastre.

Ferguson District.

MAGNOLIA MINE SALE.—Pioche *Record*, July 15: Mr. John Sevenoaks returned from Ferguson district last Saturday evening. While there he examined the Magnolia claim, and before leaving offered the Fergusson boys and Jerry Manning $35,000 for their two-third's interest in the property. The offer was not accepted and Mr. Sevenoaks returned to town. After arriving here he received word that the boys favorably considered the proposition, and this morning Mr. Jas. Hutchinson went down as agent for Mr. Sevenoaks, with instructions to consummate the sale on the original offer, but at no higher figure.

Pioche District.

LEASE.—*Record*, July 15: A lease has recently been made to Tony Nujent and others on the south contact from the 1100 level of the Yuba, where they will begin stoping ore at once. The lessees expect to do well, as the ore there is of a good grade. The last ore mined in the Day mine shows quite an improvement in value. The fluxing qualities remain the same while the silver contents of all the ore received in June went over 28 ounces in silver to the ton. R. W. Crandall of Ferguson, owner of the South Extension Magnolia claim, which adjoins the Magnolia claim on the south, has sold a half interest in his location to C. E. Holt for $3000. Work on the claim will be prosecuted at once. There is no work yet done on the property, but the Magnolia ledge is supposed to run through the ground, which fact alone fixes its value at this time. In upraising from the 950-foot level in the Yuba, over two feet of solid galena has been encountered. On the 1240 level, east of the shaft, there are three shifts being worked. The ore continues over two feet in thickness and of a good grade. Connections will be made with this level and the 1300 upraise as quickly as possible. The breast on the 1300 east level is still looking well, which proves that the ore chute being developed in this part of the mine is one of the largest ever opened in the property.

ARIZONA.

COPPER.—Prescott *Courier*, July 15: Senator Jones of Nevada has purchased a large interest in the Agua Fria Copper Company, and at a meeting of the stockholders held here yesterday was elected as a director. Mr. Isaac T. Stoddard remains at the head of the enterprise, and expects to soon have the smelter at Stoddard turning out bullion and matte.

A MINING SALE. — Tucson *Citizen*, July 16: Johnny Moran, of Pinal county, who owns an excellent, gold property called the Mammon mine, in the southern portion of the county, has succeeded in making a sale of the same and the money has been paid over. There is nothing like getting into a good mineral country and staying with it.

MINES AROUND MAMMOTH. — Mr. Allyn, of Hartford, Connecticut, has had a bond on the Mohawk mine, which is the first extension east of the Mammoth, and he has been working four to six men on it for the past six months. The parties who own this excellent property are Messrs. John Bauer, Andrew Damm, James Frazier and a Mr. Roberts, of San Francisco. The time of the bond does not expire until the 15th, but Mr. Allyn is so well pleased in every respect with the property that negotiations will be closed to-day. This another mining sale is added to the list of Arizona's acquisitions and a wish that a bountiful success will crown the efforts of the purchasers is universally expressed.

BRITISH COLUMBIA.

SLOUGH CREEK.—Nelson *Miner*, July 7: Dr. A. H. Watt, who had charge of the hospital at Richfield, Cariboo, until it was burned a week or so ago, was in Vancouver on Monday. In the matter of mining, he says that attention for the present is centered on the work of the Ramos Company on Slough creek. This company has an extensive plant on the ground, and is going to conduct a series of borings along the creek. The object of these borings will be to determine the distance to bedrock, the composition of the intervening strata, etc. Awaiting the results of these prospective borings, a great many other firms and individuals who have taken up claims along the creek are resting on their oars. A great many prospectors are now pouring into the country, more in fact than have been known to go in for many years. The grass on the grazing lands never looked better; and coming this way, the tilled land passed through showed evidences of splendid crops to be harvested this season.

COLORADO.

A POSSIBLE NEW CAMP.—*Mining and Scientific Review*, July 16: Creede has six shipping mines, with five others in large bodies of good ore and in good condition to forward large consignments to the smelters. The Amethyst tramway being completed, is bringing down from the Amethyst and Last Chance sufficient ore each day to load 15 to 20 cars. The Del Monte, the latest wonder, if not at the head of the list is very near it in strength of vein matter and value of ore. In some of the outlying districts where prospecting has been active since the snow disappeared, some valuable discoveries have been made. The latest reports are from the vicinity of Cunningham gulch, 35 miles up the Rio Grande from Creede. The mineral is oxidized lead and iron. The surface is comparatively free from wash, with rocks exposed so that prospecting is a very simple matter. The vein which has excited profound interest and will cause a rush to Cunningham if present accounts shall be verified, is said to be 18 feet wide with a pay streak of five feet which averages $225 in gold and silver and 40 per cent lead. It is simply a prospect as yet, but a very promising one. The assay value as just defined is sufficient to induce rapid development.

MONTANA.

AT BUTTA.—*Miner*, July 16: The week in mining circles has been rather quiet, nothing of a startling nature for the better occurring to break the steady rumble of the stamps and the blast of the smelter. A disastrous occurrence, however, was the failure of the Butte and Boston stockholders, to achieve the object for which a meeting was called for the 6th—that of bonding the property to raise $2,500 000 with which to rebuild the burned plant and purchase properties needed by the company in the conduct of its affairs. The Davis estate, or rather the heirs to the estate, are responsible for the failure of the company to take favorable action, yet from all accounts this objection will be overcome and the point carried. Just what the Butte and Boston officials intend to do between now and the 18th, on which date another meeting will be held at Boston, is not known, but it is palpably evident to the Davis people that their stock will be wiped out and work given to the 750 men in this city who are now idle because of their action in refusing to consent to the rebuilding of the smelter. The Butte and Boston people regret very much the necessity for such a move; but, realizing that it is their only salvation, they will do it and let Rome howl. As an evidence that the failure of the Davises to vote their stock with the others is injuring the camp, it may be stated that the only few remaining men the company kept at work after the fire were discharged Saturday evening from the Belmont claim, which the company has been developing in the Parrot addition. "With a greatly reduced force at the Anaconda, the Alice and many other properties about Butte," said a citizen yesterday, "the city and community cannot afford to have an enterprise like the Butte and Boston thrown aside to suit the fears or conveniences of the gentlemen who are so eminently conservative."

AT THE MISSOULA.—An influx of water has caused a suspension of work at the lower levels of the Missoula, but ore is being taken from above. Pumps adequate to handle the fluid will shortly be put in, and sinking will then be resumed. The ore of the Missoula averages about 80 ounces per ton, and is treated at a cost of $16 per ton. The Butte and Boston Co. owns the ground and receives from the lessees a royalty of 30 per cent. Several other parties are leasing on various parts of the claim, and although they have not yet struck the rich shoot, they are making good headway toward it.

TO ADOPT THE CYANIDE PROCESS.—The cyanide process of treating ores is to be introduced at the Southern Cross mine near Georgetown. If it can be made to successfully save the gold of the ore of this property, it will be the means of revolutionizing gold mining in Montana, as 90 per cent of the gold ores are too base to be treated by the common methods.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 21, 1892.

In trade circles business has continued active, with the demand for general merchandise coming from nearly all directions. The more distant points, which are difficult of access in winter, will soon begin to lay in winter supplies, and in the interior the buying is of an assorted character. Fall stocks are coming to hand, and soon samples will be open for inspection. In farm produce there has been continuous activity at good prices in fruit and vegetables. The past week there was more done in cereals, with an advance established, but it will take a still higher range of values to induce much selling. With the bountiful harvest and good prices received, there will unquestionably he better times among farmers, which should bring about more extensive improvements, thereby enlivening every branch of business. Among iron workers there is very little complaint. The general feeling is that of confidence and expectation of much better times. The labor strikes at the East and a general unsettling of business is expected to give our manufacturers and iron workers more business. In the local money market there is an increasing inquiry for funds. It comes chiefly from the agricultural districts, due to farmers storing grain rather than sell at current prices. Bankers do not anticipate any closeness in the local money market, owing to the large increased reserves. Wage-earners and others are putting money in bank rather than invest. This is indicated by the returns of all the savings banks in San Francisco to the Bank Commissioners on June 30th. The aggregate resources foot up $110,936,607, against $101,464,850 at the like date in 1891. The money on hand, and also in the hands of other banks, foots up $3,922,999, against $2,793,486 at the like date in 1891. This large increase in money reserve is made in the face of the loans on realty, aggregating the past fiscal year over $5,000,000 more than they did in the fiscal year ending with June 30, 1891. There appears to be a better feeling in the mining industry. This feeling will be more pronounced if the Caminetti Hydraulic bill should pass the U. S. Senate and then be signed by President Harrison.

SILVER—The market has fluctuated very little the past week, barely enough to induce operating in the market. It looks very much as if Europe is more interested in the English elections, and the probable result of the forthcoming international bimetallic conference, than in dealing in silver bullion or any other speculative commodity or security. At a meeting of the cabinet in last week, it is said to have virtually decided to appoint the following persons as representatives from this country to the conference: Senator Jones of Nevada, Senator Allison of Iowa, Henry W. Cannon of New York and General Francis A. Walker of Boston, four of the five. The entire subject of the date and the place of the conference and the names of the five American delegates, will probably be settled in this or next week.

MEXICAN DOLLARS—The market is quiet but fairly firm at 68¾@69¼.

QUICKSILVER—Receipts the past week aggregate 325 flasks. The market is weaker in sympathy with a shading in prices at the East.

BORAX—Receipts the past week aggregate 1780 ctls, and exports by sea to New York 2446 ctls. The market is steady, with a free movement Eastward. The low freight rates named by sail have induced a nwer rate by steam via Panama.

ANTIMONY—The market is in buyers' favor. New York mail advices quote as follows: 10¾@10¾c for Hallet's and 14@14¼c for Cookson's, according to quantity.

PIG LEAD—The market is dull with quotations more or less nominal. Eastern advices report a dull market with buyers more reserved.

TIN—There was received the past week from San Diego 156 pigs. The market is dull and heavy, with quotations nominally unchanged. New York advices report liquidating sales which cause a heavy market. Plate is weak with a decided falling off in the demand. London cables report a good demand for coke from this city.

IRON—The market for pig is more or less unsettled. The low freights from New York to this port, combined with very low prices at the East are against sellers. The cooper strike is against hoop iron. The Eastern pig iron market has undergone no change for the better. As a matter of fact, weakness is more pronounced at last mail advices than it was at the beginning of the month. Since their cut in prices, the Thomas Company have secured more orders, many of which bad previously been withheld, but the general demand was disappointingly slow. Competitors have sold below the Thomas prices to secure orders. For example, good Southern brands have been put in at $14.50 for No. 1 X and $13@13.50 for No. 2 X, while some Lehigh Valley product, No. 2 X, against which many dealers discriminate, was sold to the extent of at least 200 tons at $13 or $13.25. The extreme top prices on standard brands are $15 for No. 1 X, $14 for No. 2 X and $13.50 for grey lorge.

COPPER—The market, after strengthening to some extent, has fallen back again. The action of the market is disappointing. The production on this coast is light. *Iron Age* reports the New York market as follows: Business in this market has been of very moderate volume. The demand is running hebind previous calculations as well, and the general experience is doubtless disappointing. In some quarters it is intimated that the depression is at least partly due to forced sales made for effect, and that a turn for the better is likely to he made ere long, but that consumers' purchases are disappointing is patent, however, and that fact is not without effect.

COKE—The market for shipment is reported unchanged, but for spot it is very weak with a large consignment on the market. It is said that a copper company which had a stock here and to arrive of 4000 tons has been and is still selling.

COAL—Imports the past week aggregate as follows: Coos Bay, 1600 tons; Departure Bay, 4512; Newcastle, N. S. W., 1844; Sydney, 2835; total, 9791 tons. Australian advices report freights higher which causes more to he asked for shipment. English coals are unchanged. The supply of coast promises to be very large. The consumption is enlarging hut the supply on spot and to arrive is large.

Mining Share Market.

SAN FRANCISCO, July 21, 1892.

Mining shares the past week were stale, flat and unprofitable. If it had not been for a few cross-orders on eacb call there would not have been enough business to have given quotations. Even in cross-orders, business was at so low a point that at one session there were not a dozen different mines in which sales were reported. It is a tiresome game for those who are long on the market, when they see that at every little upmove the market falls back to lower prices than before the advance. It is no wonder they feel discouraged and are losing faith in the long-talked-of deal, which now appears to he as far off as ever. There are only three things which can be looked for with the utmost confidence, viz., assessments, the spiriting away of the hulk of the hullion product and a large number of poverty-stricken persons, reduced to that condition by the high-handed way in which the mines are managed—and there are those who call it sharp business sagacity. Cappers' and tools', who continue to make excuses for the stock pools and mill rings, chief stock in trade is that there is no ore in the mines on which a deal can he made. If these camp-followers believe such reports, then the sooner they quit the business the better; but if they circulate them so as to work into the hands of inside rings, then their action is inexcusable. A man who will do dirty work for another, lacks only the opportunity of doing dirty work for himself, and therefore should he and doubtless is, closely watched by those for whom he works. It is on the same principle that a man who steals for another will steal for himself. There is not the least doubt but the rings can show up on the Comstock, whenever they desire to, two or more bodies of ore rich in gold, hut they appear to he playing a waiting game, and in the meantime get outsiders to sell out their shares by disgusting them with assessments and the dismal owlish croakings of paid cappers and tools.

The high grade ore (gold hearing) that is being developed in two or more of the mines on the Comstock appears to have been marked for looting, hut it now looks as if the rings were afraid to commit any more overt acts, for members of the Mining Stock Association and members of the Brokers' Combine are too watchful. It looks very much as if, fearing to misappropriate hullion, the rings have resorted to legalized, to a certain extent at least, methods (assessments, etc.) of robbing outsiders of their long held shares, so that when compelled to show up the ore the public will have very few shares in the mines. Evidently the rings see the handwriting on the wall and are setting their sails accordingly. The decision of Judge Hebhard of the Circuit Court in this city in the suit of M. W. Fox against the directors of the Hale & Norcross Mining Co. has done no little in awakening persons directly to the wrongs which are being perpetrated. This feeling is not confined to this Coast, as is shown by the following excerpt from a leading financial paper at New York city: The New York correspondent of a Philadelphia newspaper writes: "The traders here are placing considerable reliance upon the convention at Helena, Mont. Lawrence V. De Foreest, who is the delegate from New York, is under instructions to lay before the convention certain plans which it is thought will tend to create activity in the market. Trading has been so light of late that the brokers and speculators have been almost discouraged, hut Mr. De Foreest thinks that better times are near at hand. At the meeting of the Board of Directors of the Consolidated Exchange, at which he was chosen delegate, a resolution was adopted that he advocate rules for the prevention of dishonesty on the part of owners and officers of mines. Said Mr. De Foreest: 'I am confident that if we can put a stop to the systematic deception which is being practiced upon the public, the market will he rescued from the lethargic condition which has so long prevailed. There has been so much dishonesty that it is no wonder that the great majority of the people are unwilling to have anything to do with mining shares. There will be some pretty plain talk at the Helena convention, and if some abuses are not remedied it will not he my fault.' The Exchange managers are very confident that Mr. De Foreest will be very outspoken at Helena."

The street is full of rumors pro and con nn the mining situation, with the general opinion among the better informed that the secret work which has been carried on with more or less energy the past three years has placed it beyond the question of a doubt that the west or red lode is richer in gold-hearing ore than was claimed by many. It is doubtless this knowledge which causes chronic hulls, who operate in shares on the condition of the mines and not the situation of the share market, to willingly pay assessments. Late and seemingly reliable advices from the Comstock mines report that in Mexican the work is of a very interesting character, as it is in Ophir. In the joint Union-Sierra Nevada west drift every indication points to the early tapping of the west lode. In Hale & Norcross active prospecting work is under way on or about the 1800-foot level to tap the downward continuation of the rich ore found above to the west. On the 1950-foot level in Con. Virginia a body of high-grade ore is being developed. In the Gold Hill group of mines it looks as if the work which is now being publicly given out, ought to show up some rich ore at an early day. The work that is being pushed in the Alta group, and also that in the Occidental mine, deserves close watching—it is very important. In the outside mines the news begins to grow more interesting; this is doubtless due largely to the fact that the public holds very few of the shares.

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ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED, DELINQ'T AND SALE.	SECRETARY.
Alta S M Co, Nevada	42	15c	June 18, July 26, Aug 18	L Osborn, 309 Montgomery
Belle Isle M Co, Nevada	14	10c	June 16, July 21, Aug 12	J W Pew, 310 Pine
Bodie Cons M Co, California	14	25c	June 20, July 22, Aug 22	H D Walker, 3.9 Montgomery
Butte King M Co, Nevada	8	5c	June 4, July 11, Aug 2	W C Lewis, 723 Market
California Verde Antique Marble Co, Cal	2	1c	July 12, Aug 22, Sept 12	W J Gurnett, 308 Pine
Chollar M Co, Nevada	33	50c	May 28, June 7, July 27	C E Elliott 309 Montgomery
Commonwealth Cons M Co, Nevada	8	10c	June 15, July 21, Aug 18	R R Grayson, 331 Pine
Con St. Gothard M Co, California	5	5c	June 9, July 14, Aug 4	T Wetzel, 320 Sansome
Cons New York M Co, Nevada	8	10c	June 26, Aug 2, Aug 23	C E Elliott, 309 Montgomery
Evening Star M Co, California	4	25c	June 7, July 12, July 29	J J Scoville, 320 Sansome
Fall River Con M Co, California	8	3c	May 27, July 2, July 27	A Lorshach, 409 Clay
Gold Mt M Co, California	3	$2	July 18, Aug 20, Sept 8	J F Curtis, 325 Montgomery
Gould & Curry M Co, Nevada	69	52c	June 7, July 12, Aug 4	A K Durbrow, 309 Montgomery
Gray Eagle M Co, California	29	6c	July 5, Aug 9, Aug 13	A W Barrows, 303 California
Kentuck M Co, Nevada	4	10c	July 15, Aug 18, Sept 8	J W Pew, 310 Pine
Mexican Phosphate and Sulphur Co	1	10c	June 3, July 18, Aug 8	A Halsey, 328 Montgomery
Ophir M Co, Nevada	58	60c	June 3, July 7, July 27	E B Holmes, 309 Montgomery
Peerless M Co, Arizona	18	5c	July 6, Aug 11, Sept 7	A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	5c	July 11, Aug 14, Sept 12	G R Spluney, 310 Pine
Sierra Nevada M Co, Nevada	102	25c	June 10, July 13, Aug 2	E L Parker, 309 Montgomery
Summit M Co, California	12	5c	June 27, July 19	M E Welles, 309 Montgomery
Tarbolt G M & M Co, California	8	1c	May 31, July 6, July 23	W J Gurnett, 308 Pine
Union Cons M Co, Nevada	46	20c	July 18, Aug 24, Sept 13	A W Barrows, 303 California
Utah Con M Co, Nevada	15	25c	June 7, July 11, July 29	A H Fish, 309 Montgomery

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Benton Cons M Co, California	Annual	V B Allen, 319 Pine	July 27
Bodie Cons New York M Co, Nevada	Annual	C E Elliott, 309 Montgomery	Aug 6
Derbec Blue Gravel M Co, California	Annual	T Wetzel, 320 Sansome	Aug 2
Dora G M Co, California	Annual	C Colman, 309 Montgomery	July 27
Jack Rabbit M Co, Nevada	Annual	T Wetzel, 320 Sansome	Aug 8
Lady Washinton Cons M Co, Nevada	Annual	L Osborn, 309 Montgomery	July 27
Live Oak Drift Gravel M Co, California	Annual	E Cuenimant, 313 Montgomery	July 30
Mt Tunnel Gravel M Co, California	Annual	E O Lauder, 219 Sansome	July 28
Riverside M Co, California	Annual	J Stadfeld, 309 Montgomery	July 26

LATEST DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 3.9 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	July 18
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 303 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Juua 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	July 11
Standard Cons M Co., California	10	J W Pew. 310 Pine	July 26

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 29.		WEEK ENDING July 6.		WEEK ENDING July 13.		WEEK ENDING July 20.	
Alpha	.15	.20	.20	.30	.20	.25	.20	....
Alta	.15	.20	.15	.20	.20	.25	.25	.30
Andes	.30	.35	.40	.45	.40	.45	.35	.40
Belcher	1.05	1.20	1.25	1.95	1.25	1.65	1.15	1.35
Belle Isle	.03	....	.05	....	.05	....	.05	....
Best & Belcher	1.50	1.65	1.65	1.95	1.80	1.90	1.55	1.90
Bullion	.30	*.55	.50	.65	.50	.55	.30	.50
Bodie Con	.10	.15	.15	....	.20	....	.10	.15
Bulwer	....	....	....	....	.45	....	.40	.45
Commonwealth	.05	....	....	....	....	....	.05	.15
Con. Va. & Cal	3.20	3.55	3 35	3.35	3.60	3.90	3.60	3.85
Challenge	.40	....	.50	.65	.50	.60	.40	.50
Chollar	.20	*.70	.75	.85	.65	.80	.60	.75
Confidence	1.25	....	....	....	1.80	....	....	....
Con. Imperial	.05	....	.05	....	.05	....	....	....
Caledonia	.15	.25	.20	.30	.25	....	.20	....
Crown Point	.70	.85	.80	1.25	.90	1.15	.75	.96
Crocker	....	....	....	....	....	....	....	....
Del Monte	....	....	....	....	.05	....	.05	....
Eureka Con	....	....	....	....	2.25	....	....	....
Exchequer	.10	....	.15	....	.15	....	2.10	....
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.55	.70	.70	.95	.85	*1.10	1.00	1.05
Hale & Norcross	1.25	1.40	1.35	1.50	1.30	1.40	1.20	1.35
Julia	....	....	.05	....	.05	....	.05	....
Justice	....	....	.15	.20	.15	....	.15	....
Kentuck	.10	....	.15	....	.10	.15	.15	.10
Lady Wash	....	....	....	....	.10	....	....	....
Mono	....	....	.35	....	.40	.45	....	....
Mexican	1.25	1.40	1.40	1.70	1.55	1.70	1.50	1.70
Navajo	.05	....	....	....	....	....	....	....
North Belle Isle	.10	.15	....	....	.05	....	....	....
Nev. Queen	.45	.50	.45	*.60	.30	.45	.35	.55
Occidental	.30	.35	.30	.40	.35	....	.35	....
Ophir	1.35	1.80	1.50	*2.60	2.35	2.80	2.50	2.75
Overman	.50	.60	.80	.75	.60	.70	.40	.50
Potosi	.50	.55	.55	.70	.45	.70	.40	.50
Peerless	....	....	....	....	....	....	....	....
Peer	.10	....	....	....	.05	....	....	....
Savage	1.35	1.45	1.40	1.60	1.30	1.55	1.10	1.30
S, B. & M	.25	....	.25	.35	.30	.35	.25	.30
Sierra Nevada	.60	.80	.75	1.00	.90	*1.20	1.15	1.25
Silver Hill	.05	....	.05	....	....	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.70	.90	.85	1.25	.95	1.10	.85	1.10
Utah	.05	....	.05	.10	.05	*.35	.25	.30
Yellow Jacket	.75	.85	.85	1.00	.80	1.00	.65	.85

*Assessment added.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb	— @ 15	English, lb	— @ 18
BORAX.		Canton tool	— @ 8½
Refined, in car lots	— @ 7½	Bl'k Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	6½@ 10
Concentrat'd, do	— @ 6½	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		TINPLATE.	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 00
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 6 00
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 6 00
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @12 00
IRON.		PIG TIN.	
Bar, base	— @ 3	Spot ℔ lb	— @ 24
Norway, base	— @ 4½	COAL.	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton ℔ ton	22 00@— —	Wellington	$8 00
Glengarnock	23 00@— —	Gretta	6 75
Am. Soft, No, 1	24 00@— —	Nanaimo	7 00
Oregon Pig	— —@— —	Gilman	6 00
Puget Sound	— —@— —	Seattle	6 50
Clay Lane White	24 00@— —	Coos Bay	5 50
Langloan	22 00@— —	Cannel	8 50
Thorncliffe	23 00@— —	Egg hard	11 50
Carnbrie	22 00@— —	Cumberland, in sacks	14 00
Barrow	22 00@— —	Do, bulk	13 00
Cargofleet	22 00@— —	Wallsend	7 00
CHROME IRON ORE.		Scotch Splint	7 00
Per ton	10 00 @— —	Brymbo	6 75
LEAD.		West Hartley	7 50
Pig	— @ 4½	TO LOAD—PER TON.	
Bar	— @ 5½	Australian	5 75@— —
Sheet	— @ 7	Liverpool Steam	6 00@— —
Pipe	— @ 6½	Scotch Splint	6 00@— —
SHOT.		Cardiff	6 25@— —
Drop, sizes *smaller* than B	$1 85	Lehigh Lump	12 00@— —
℔ bag of 25 lbs		Cumberland	9 00@— —
Do do, B and *larger* sizes ℔ bag of 25 lbs	2 10	West Hartley	6 50@— —
		COKE.	
Buck, Balls and Chilled do, ℔ bag of 25 lbs	2 10	English, to load	$8 00@ 9 00
QUICKSILVER.		Do, spot, in bulk	— —@10 00
Home trade, pr. flask	$43 50 @44 00	Do, in sacks	— —@12 00
For export	38 @	Cumberland	9 00@— —

Eastern Metal Markets.

NEW YORK, July 20.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39¾	86¾	11 25	4 10	20 70
Friday	39¾	86¾	11 25	4 10	21 00
Saturday	39¾	86¾	11 25	4 10	21 80
Monday	39¾	86⅞	11 25	4 10	20 80
Tuesday	39¾	86¾	11 35	4 05	21 65
Wednesday	39¾	86¼	11 35	4 05	21 65

Tin is weak at the decline. Lead is slow and heavy. Quicksilver is lower. Pig iron is unsettled and lower. Copper is barely steady.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDINO JULY 12, 1892.

478,903.—FRUIT GATHERER—S. E. Bsll, Winters, Cal.

478,910.—TRAP FOR CABLE CONDUITS—Bishop & Bell, S. F.

478,911.—CABLE GRIP LIFTER—Bishop & Bell, S. F.

478,915. — BRICK MACHINE—W. Burkman, S. F.

478,922.— AMALGAMATOR—Connors & Eddy, Grass Valley, Cal.

478,932.—LINK LIFTER—John Finney, Portland, Or.

478,854.—GRINDINO WHEEL ATTACHMENT—J. H. Goetsche, S. F.

478.593.— WINDOW FRAME — W. T. Gregg, Lakeport, Cal.

478,872.—VAOINAL SYRINOE—J. D. Kirkwood, Pullman, Wash.

478,875.— ROPE-DRIVINO APPARATUS — Macdonald, Williams & Hitzeroth, S. F.

478,886.—SAW SWAOE—A. L. Navone, Calistoga, Cal.

478,968.—ELECTRIO MOTOR—H. F. Ong, Newbnrg, Or.

478,766.—RAILWAY RAIL—J. T. Smith, S. F.

478,773.— CABLE RAILWAY GRIP—C. Vogel, S. F.

21,703.—DESION FOR MEDAL—Quinby & Bates, Fresno, Cal.

The following brief list hy telegraph, for July 19, will appear more complete on receipt of mail advices:

San Francisco—Edgar Badlam, air-supplying device for gas machines; Lafayette E. and A. E. Bowser, stepladder; Joseph Bertrand and George Fleischel, lock; Joseph C. Ingram, copying device; Samuel E. Murray, rope-guiding sheave; Paul Seiler, alarm-signal apparatus; William A. Woods, water gauge.

California—Charles Johnson and O. Olson, San Jose, cultivator; Theodore W. Lenzen and L. Heckenroth, San Jose, blacksmith's forge; Malcolm MacLeod, Los Angeles, agricultural implements; Lavolser Moreland, Ogilby, amalgamator and ore concentrator; George A. Stephenson, Los Angeles, suspension truss hridge; Edward Thomas, Los Angeles, can stand.

Washington—Marvin G. Calcut, Seattle, elevator; Ernest R. Denny, Spokane, csse for exhibiting needles; Charles H. Dow, Ellensburg, dump car; James R. Lutgen, Wenlock, boiler; Charles Morgan, Latah, can opener.

Nevada—Samuel Emrich, Reno, railway signal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

LIFTINO MEOHANISM FOR CABLE-GRIPS. — Ira Bishop and Arthur F. Bell, S. F. No. 478,911. Dated July 12, 1892. In the operation of cable roads it is often necessary to remove the grip from the tuhe or tunnel, which removal is effected through openings or traps in its top and located at suitable intervals throughout the length of the road. This invention provides a means for lifting the grip out of the tnhe and lowering it again when required. The grips are quite heavy and cannot be handled readily by one man under ordinary circumstances. This patented mechanism provides a simple and effective means for handling the grip, hoth in raising and lowering.

BRICK-MAOHINE — Walfrid Burkman, S. F. No. 478,915. Dated Jnly 12, 1892. This is one of that class of machines for compressing plastic material into shape, in which opposing plungers operate npon the material which is delivered to the mold by a reciprocating feed-

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FREDERICK COX, President. EDWIN F. SMITH, Secretary.

box. The invention consists essentially in plungers the movements of which are so timed that the material will be compressed partially from one side, then more forcibly from the opposite side to a plane beyond its center, and finally again, and fully compressed from the first side. The object is to provide a macbine of this class especially for making bricks, in which the pressnre shall be applied to the material in the most effective manner to obtain an equal and general compression throughout the mass, thereby making a snperior brick.

FRUIT GATHERAR.—Samnel F. Ball, Winters, Yolo Co. No. 478,903. Dated July 12, 1892. The fruit gatherer is one of that class in which is employed a receiver adapted to be fitted around the tree-trunk and catch the fruit which is shaken down. The object is to provide a gatherer of this class adapted to be easily transported from tree to tree, to be adjusted in various positions to snit different trees and the lay ot the gronnd, and to be readily and quickly set in place under the tree.

AUTOMATIC TRAP FOR CABLE CONDUITS.—Ira Bishop and Arthur F. Bell, S. F. No. 478,910. Dated July 12, 1892. It is usual in cable railways to provide openings in the top of the tube or conduit at suitable intervals, through which the grip can be removed and replaced. The necessity for nsing these openings has not heretofore been very great, because the reasons for removing the grip have been few, such as to readjust or repair it. Consequently, the doors or covers of the openings have always been manipulated by hand; but in some roads the grip has to be removed oftener and for other reasons, as, for example, where there are sections of the road over which the car travels by gravity and there is no need to keep the grip in the tube, or, in fact, where there is no tube at all. In such cases, therefore, the grip has to be removed and replaced—it may be several times each trip. It then becomes of importance to provide means for easily uncovering said openings, and it is the object of this invention to provide such means. This object is attained by the provision of means for automatically accomplishing the result, which result is due to the arrival of the car itself at the point where it is necessary to uncover the tube or tunnel. There are suitable connections actuated by the car to operate the doors or covers to expose and close the openings.

ENVELOPE OPENER.—Wm. D. Rogers, Alameda, and Jay D. Van Buren, S. F. No. 478,889. Dated July 12, 1892. This device for opening envelopes consists of a triangular or trapezoidal card placed in the envelope and having a small cord attached to its upper acnte angle projecting through the side of the envelope so that it may be pulled. The edge of the card then acts like a paper knife to cut the end of the envelope smoothly and the card itself serves to carry printed or advertising matter of any description.

SAW SWAGING DEVICE.—A. L. Navone, Calistoga. No. 478,886. Dated July 12, 1892. This is one of that class of swaging machines in which, by lever mechanism, the tooth is operated upon between a swage cam and an opposing anvil. The invention provides a simple, powerful and readily adjustable saw swager, in the operation of which the teeth will he sharpened as well as swaged.

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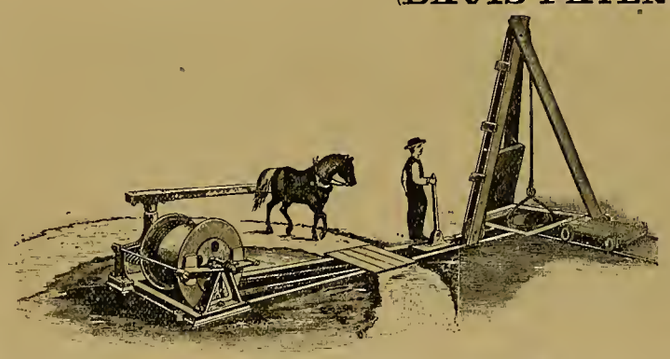
BUILDERS OF
"Sensible" Horse-Power Hoisting Whims.
(DAVIS PATENT.)



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NOTICE OF ASSESSMENT.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 12th day of July, 1892, an assessment (No. 2) of One Cent per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 3 8 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 22d day of August, 1892, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 12th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors.
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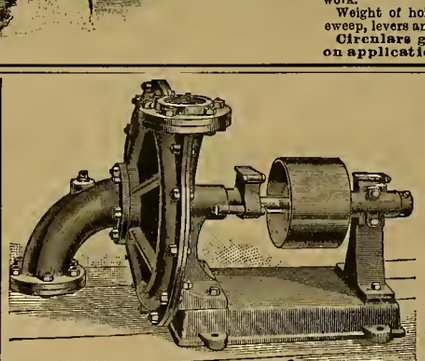

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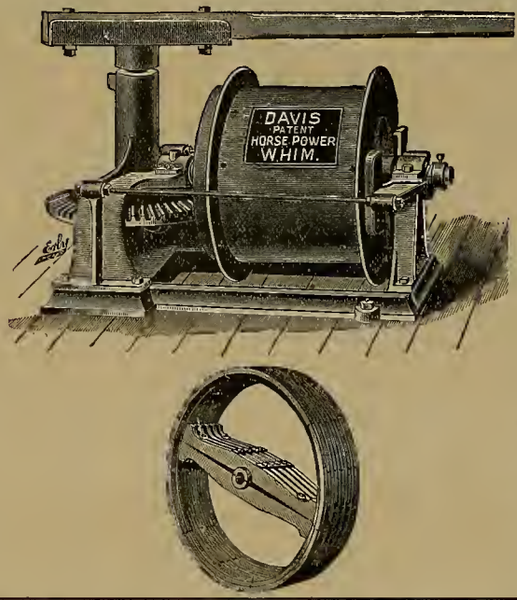

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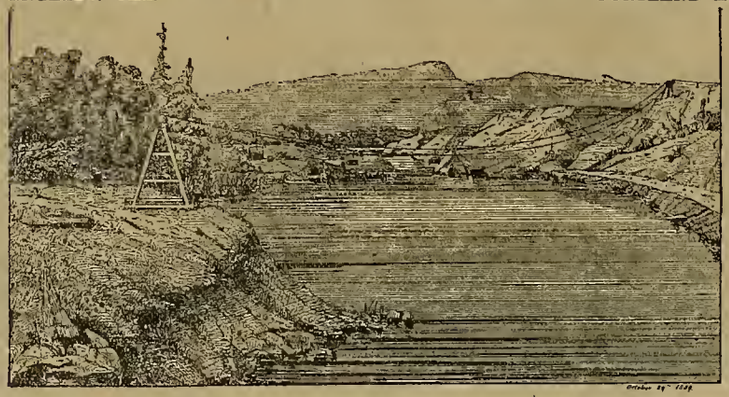

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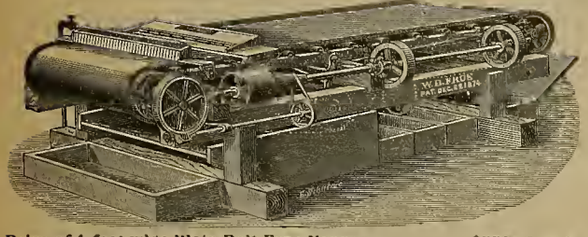

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Office of General Manager,
P. O. Address, South Riverside, San Bernardino Co., Cal.
CAJALCO, Dec. 18, 1891.

MESSRS. ADAMS & CARTER, 132 Market Street, San Francisco, Cal.—GENTLEMEN: After a continuous trial of different concentrators comprising the Frue Vanner, the "Holland," "Paradox," "Triumph" and the "Woodbury" concentrators), extending over several months, we find that we prefer the Frue Vanner, as it is easier of adjustment, runs smoother, has less wear and tear, and—having a positive travel—gives less trouble than the other more complicated and ever changing machines now in use here. The Frue Vanner not only saves a cleaner concentrate, but has less loss in the tailings, and is in several ways preferable to the other concentrators here.

I am, my Dear Sirs, Yours faithfully,
S. HARRIS, Manager.

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" 6-foot " Plain Belt Frue Vanner..... 800, f. o. b.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL LXV. – Number 5.
NEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, JULY 30, 1892.

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James Clayton.

We present herewith a recent portrait of James Clayton, proprietor of the Clayton Air Compressor Works, Brooklyn, N. Y., whose name is widely known throughout the engineering profession on account of the celebrated machines, to the perfection of which he has devoted almost a lifetime. Mr. Clayton comes of an old English family, and was born in Homer, Eng., in the year 1822. He came to thie country in 1849, and proceeding to California, via Panama, located eventually at Grass Valley, Nevada county. There he acquired the Scadden Flat or Clayton Diggings, as afterward known, which he operated several years and finally sold, going East and settling in the city of Brooklyn, where he began the manufacture of the Clayton Fly Wheel steam pump, of which he was the inventor and patentee. These pumps met with a wide sale, until the advent of the direct acting pump, when Mr. Clayton turned his attention to the study of pneumatic machinery, realizing that this branch of mechanics had been too long neglected and that the air compressors then on the market were most primitive.

The first Clayton air compressor was built in 1873, and was used in building the tunnels in New York City for the sunken tracks of the Harlem Railroad, and achieved great success. Since that time, Mr. Clayton has been carefully and steadily making improvements on his compressors, and continually raising the standard of efficiency, until to-day the machines bearing his name are synonyms for excellence in pneumatic machinery, large numbers of them being at work on this coast. Mr. Clayton, now in his seventieth year, is as hale and hearty as a man ten years his junior, and notwithstanding the lapse of time since he left here, his portrait will be recognized by some of his old-time friends. Mr. Clayton has recently departed for Europe to spend a well-earned vacation, visiting his brother, Mr. Thomas G. Clayton, superintendent of the Midland Railway, and traveling on the continent.

JAMES CLAYTON, DESIGNER OF AIR COMPRESSORS.

GOVERNOR MARKHAM has been presented with a very handsome gold match-box by the Executive Committee of the Miners' Association. On the back of the match-box is the inscription: "Presented to Governor Markham by the Miners' Association of California. J. H. Neff, president. S. K. Thornton, vice-president. W. C. Ralston, secretary. Taken from Gould & Doolittle mine, May 28, 1892." Accompanying the presentation was a set of resolutions thanking the Governor for his efforts in the interest of the miners.

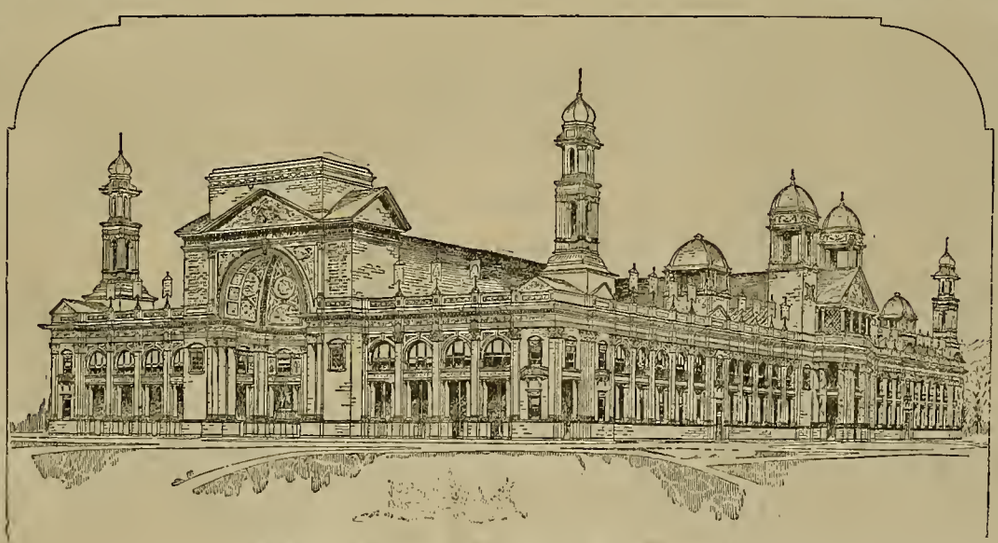
JOHN F. DAVIS of Calaveras Co. defeated Grove L. Johnson of Sacramento for the Republican Congressional nomination in the Second District. Mr. Davis is an energetic young man who is very friendly to the mining industry, and would do all he could to help it if elected.

THE East Side Miners' Association has been organized in Shasta county to promote the mining interests on the east side of the Sacramento river. Meetings will be held on the last Saturday of every month at Old Diggins. The miners of that district with those of Buckeye and Churntown compose the organization. The revenue from dues will be used mainly to advertise the mining interests of the East Side. Mr. H. D. Rippeto, Supt. of the Walker mine, is president and S. S. Stickley of Newtown is secretary and treasurer. This organization should be able to accomplish a good deal for the region referred to.

The Electrical Department of the World's Fair.

The primary object of the electrical department of the World's Fair is the demonstration in actual operation of the commercial and economic application of electricity. It is desired, moreover, to make exhaustive tests of electrical apparatus in all possible directions, with a view to establish the actual efficiency of the same in comparison with other and older methods of accomplishment. In addition to these practical features, it is contemplated to present object lessons of interest and instruction, showing the development of the science from its formative or initiatory state to the present time. The accomplishment of this object will take the form of a historical exhibit embodying models, drawings and crude machinery made and used by pioneers in the science. Every possible field of electrical work will be liberally considered, and all systems of all countries will be placed as favorably as possible, to the end that the best results may accrue to the electrical people and the public at large.

The electrical building, of which an engraving is shown on this page, is designed to contain the entire electrical exhibit of the fair. It is 700 feet long and 345 feet wide, its length being from north to south. The general plan is a longitudinal nave 115 feet wide and 114 feet high, crossed by a transept of the same width and height. Longitudinal galleries will extend along either side of the building, 115 feet wide, at a height of about 30 feet above the main floor. These galleries will be connected by narrow galleries at either end supported by trusses.



THE ELECTRICAL BUILDING FOR THE WORLDS' FAIR.

THE discovery of gold in California was made by James W. Marshall, who found a little nugget in the tail-race of Sutter's mill at Coloma. The original nugget has been for many years in the Safe Deposit vaults in this city, but every one will now have a chance to see it, since it will be taken to the California State Mining exhibition at Sacramento next September.

THE Ely Mill and Mining Company at White Pine, Nev., has just completed cyanide works at its mill. It has put in four tanks of 30 tons capacity each. A tramway with a car attached is rigged up with water power to carry the tailings from the dumps to the tanks. High up above these tanks is the cyanide tank, which is connected with the other tanks by a pipe. This is so arranged that it can be used on the battery pulp when working ore as well as on tailings.

AT the annual meeting of the stockholders of the Lady Washington Mining Co., the following officers were elected: Monroe Thompson, pres.; R. N. Graves, vice pres.; and J. E. Jacobus, S. G. Whitney and W. B. English, directors. L. Oshorn was reelected secretary, and his financial statement showed a credit of about $6000.

MINING AND SCIENTIFIC PRESS.

BY THE DEWEY PUBLISHING CO.

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO, SATURDAY, JULY 30, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Position as Superintendent Wanted—Secretary Concordia Club.
Mine for Bond—Box 1, Pony, Montana.
Position Wanted by Mining Engineer—Box W, this office.

☞ *See Advertising Columns.*

An Individual Alarm Signal Apparatus.

Paul Seiler, the well known electrician of this city, has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency a device which he calls an "individual alarm signal apparatus," the object of which is to obtain a special connection between two offices for telsgraphic, telephonic or other purposes. It is quite an ingenious invention and one which will be found very convenient, especially to agents at small stations. In railroad telegraphing, where it is often required to call the agent at night, the ordinary call from the instrument at the office would be annoying and would necessitate the operator being on the spot at all times, while at many isolated stations it is not necessary to call the operator except on special occasions. By the employment of this device the operator may live at any distance from the office, and when he is wanted at the instrument a special call will operate a signal or alarm conveniently located. The invention is also serviceable for calling policemen to their station, to light a lamp, to switch on an electric light or ring a bell for policemen to come to nearest police-box for orders, while in the telephone service it may be used to call up any desired station without alarming any other, and, as the operator in the central office is always on duty, a simple call from any of the other stations will attract the attention of the central office without giving a sound at any other station except the central. This is especially useful on telephone lines that connect towns where there are many stations on the same line.

The device consists in the employment of a polarized relay, the armature of which is adapted to stand in three different positions; a disk containing a number of pins, the movement of this disk being effected by clockwork and governed by a magnet; another magnet, the armature of which acts both as a pawl and short-circuiting device, and a third magnet with an armature; and a releasing device for automatic mechanism and the establishing of a contact to operate any alarm or signal which may be connected therewith. As it is highly important that signals or alarms should only be sent by the chief operator or train dispatcher to any of the offices, the apparatus is arranged so that it can only be operated from those stations having control of the battery and a suitable current-reversing switch.

Comstock Mine Products and Mill Returns.

On the 14th of March the Hale & Norcross mine passed into the hands of parties who, it was understood and believed, would inaugurate a series of reforms which would be for the benefit of the stockholders who had been so unconscionably fleeced by those previously in control.

Under the new management, and in pursuance with instructions received from the stockholders at the annual election, the reduction of the ore of the company was taken from the notorious Nevada mill and was continued at the Brunswick mill. This mill also has an "annex." The returns are now in, and we publish with this the details of the crushing of ore at the Brunswick mill under the management of the "reform" party:

HALE AND NORCROSS SILVER MINING COMPANY.

Date.	Tons Worked.	Average Value Car Samples.	Value as per Car Sample Assay.	Average Battery Assay.	Value as per Average Battery Assay.	Bullion to Company, with Silver at $1 29.29.	Discount and Charges on Bullion.	Net Returns to Company in Bankable Funds.	Per Cent of Battery Assay Saved.	Per Cent of Car Sample Assay Saved, Bullion.	Yield per Ton in Bullion.	Net Yield in Money.
BRUNSWICK MILL.												
March, 1892	400	$19 09	$36,271 00	$14 93	$ 5,996 00	$ 4,418 55	$1,073 93	$ 3,344 62	73 69	.....	$11 04	.....
April, 1892	1,900	22 58	42,902 00	15 64	29,716 00	20,802 11	4,941 09	15,861 02	70.00	57 35	10 95	$8 35
May, 1892	1,900	18 82	34,173 54	15 40	29,431 00	19,095 67	4,641 35	14,454 31	64 88	46 84	10 05	7 60
June, 1892	1,815			17 16	31,159 30	19,810 53	4,390 71	15,419 82	63 58	57.97	10 91	8 49
Totals	5,615		$113,346 54		$90,306 30	$59,708 31	$13,973 16	$45,735 15				
Averages—April, May and June	1620	$20 16		$16 09					66.13	54 05	$10 63	$8 14
OCCIDENTAL MILL.												
April, 1892	110			$15 24	$ 1,676 40	$ 1,417 18	$395 04	$1 022 14	84 5		$12 88	

By reference to this table it will be seen that during the months of April, May and June the Company milled 5615 1620-2000 tons of ore, valued at the mint at $113,346.54, which returned them in bankable funds $45,735.15, a difference of $67,611.39.

It is in place to investigate where this very large difference occurs. D. B. Lyman, Superintendent of the Consolidated California and Virginia, testified in the trial of Fox vs. Hale and Norcross Mining Company that there was a difference of 10 to 12 per cent between the car sample assays and the mill assays, and that the mill should always return not less than 65 per cent of the car sample assays.

John W. Mackay, in the same case, testified that the old contracts on the Comstock were to the effect that mills should purchase the ore by wagon assay at 65 per cent of that assay. He also testified that ore worth $14.00 per ton, car sample assay, at the Con. Virginia would pay all expenses and a small profit.

As these parties are mining men of long experience, their testimony can be safely taken as a basis for the analysis of the returns of the reform management of the Hale and Norcross.

Sixty-five per cent of $113,346.54 is $73,675.25. The company got in bullion $59,708.31, showing a loss of $13,966.94. Inasmuch as under the alleged customs of the Comstock country the mill got the tailings, this little plum went to the millmen. There is no profit to them to work the ore to a high per cent, for the less the company gets the more the mill gets. The custom claimed is simply a premium on dishonesty, and the result is seen in the fact that the millmen of Nevada are millionaires, while the shareholders in the mines that furnish the ore are paupers.

The account stands as follows: 5615-1620 tons of ore, assay value at mine, $20.16; value gross, $113,346.54; received for the same in bankable funds, $45,735.15; paid for milling 5615-1620 tons at $7, $39,310.67; net returns from $113,346.54 worth of ore delivered to the Brunswick mill, $6,424.48. This is 5.66 per cent of the value of the ore, or, in other words, ore which was worth $20.16 per ton at the mine, netted the company $1 14 per ton.

To recapitulate: Out of a ton of ore assaying at the mine $20.16, the mine gets $1.14 gold; the mill gets in gold coin, for crushing, $7, and the profits of the annex, which amount to bullion of the value of $2.48 per ton, or in all about $9 per ton in gold. With these figures before us, the question is easily answered whether the mines are run for the benefit of the stockholders or the mills. We have omitted in the above to call attention to the fact that during the month of April, when the Brunswick mill returned only 70 per cent of the battery assay, the Occidental mill returned 84 per cent. The figures in the table are all made up from the official records of the company.

When the Hale & Norcross mine passed to the bands of the present management, we are told that they were advised that responsible parties stood ready to reduce the ore of the company and would give them bonds to return them 70 per cent of the battery assay and charge them nothing for the milling. Under this arrangement, the new management would have received for the output of the months of April, May and June the sum of $63.214.10 in bullion, and allowing the same percentage for discount as by the table to make bankable funds, would net $48,403, against $6,424 48 received, or a loss of $41,978.52. Such management of trust properties as this should be promptly punished, and those directors who are responsible be compelled to pay the amount lost through their bad management. It is a source of congratulation to the stockholders that, as far as is publicly known, the mine is not entrusting any more ore to the thrifty millmen, and that movements are afoot to purchase a mill which should be put into different hands from those now employed.

The White Hills District.

In the White Hills, 50 miles north of Kingman, Arizona, some gold and silver mines have been discovered, which are turning out so well that they are attracting the attention of miners in California, Nevada, Colorado and New Mexico. Prospectors are numerous and bard at work. The camp is in Mohave county, in the Sacramento valley, about 50 miles from Hackberry, the most traveled route, however, being through Kingman. It was discovered by Judge Henry Schafer, who some nine years ago found some peculiarly rich float rock while making a trip from Eldorado canyon to Gold Basin. Ever since then he has searched occasionally for the ledge. He tells the story of how he got the original claims as follows:

"On one trip last May I had an Indian with me to pack water, and I induced him to show me where his father got the black oxide of iron which the tribe used as paint. The old man had a monopoly of this paint, keeping the locality a strict family secret and selling the stuff as required to members of his tribe. He made a good profit from his secret, as the black paint makes an attractive contrast with the red and yellow pigments which these Indians use on their bodies. He showed me this deposit, and it now forms the east end of the locations which I afterward made. It was from this incident that I named the locality Indian Secret Mining District. Although the ledges at this point are rich, they are not the source of the float rock, but I will locate it in time. The story told about the $200 being given to the Indian to guide me to this place is not correct, although, of course, he has been well rewarded. I had made a standing offer to all Indians of that amount for information regarding any rich mineral deposits, this sum of money, with them, being equivalent to a fortune. However, when I 'horned' some of this black oxide, I found traces of gold, and after making a cut and finding two ledges coming in at this point, of good width, I set to work to secure the ground as thoroughly as possible without giving the discovery any publicity."

Judge Schafer was in San Francisco this week, and has sold 13 of the claims to San Francisco and Stockton men for a price said to be $200,000. Six of the properties—the Horn Silver, Grand Army, Garfield, Treasure, Norma and Occident—are said to have about 1000 tons of ore in sight. Some 30 tons have been shipped and yielded from $250 to $500 per ton at the mill at Kingman. Water is very scarce at the camp and sells at $1.50 per barrel. As an inducement for some one to start a laundry there, E. W. Spears offers to furnish a lot and a tent and sell water at $1.25 per barrel. The miners will not be apt to wear boiled shirts in that camp for some time to come. Several hundred men are already on the ground and the usual saloons, houses, tents, gambling houses, etc., are to be found. Attempts are being made to find water by means of wells, and they will also bore for it. From all accounts, the ores of the camp appear to be exceptionally rich. There are no mines yet, and the deepest prospect shaft is only 30 feet, so the question of permanency is yet to be decided.

Coast Industrial Notes.

JACKSON DENNIS of Sutter Creek, Amador Co., is running pipe for water power for a new electric lighting plant on a small scale.

WORK is to be resumed on the new Bear valley dam at once. The dam was to be begun last season and built up a distance of 15 feet.

WORK has been commenced on the iron bridge across East street, near Howard, connecting the coal bunkers on Mission pier 2 with Rosenfeld's Sons' coalyard.

THE Southern Pacific has a special steamboat to travel up and down the Sacramento river gathering fruit for shipment East. The boat collects large quantities to be made up in carload lots.

THE big raft which was towed down from Noyo by the steamer Noyn consists of nearly 2,000 piles. It was 70 feet wide and nearly 1,000 feet in length. The raft was taken to Mission bay and broken up last week.

A LOT of machinery and supplies have been sent to the Bright Star mine, on Plute mountain, by Parke & Lacy of San Francisco and the St. Louis owners of the property, and it is stated that work will be resumed in the shaft just as soon as possible.

THE new steamer Peru, the largest merchant steamer yet built by the Union Iron Works of this city, is nearly ready for her first voyage to sea. She has been towed down to the Mail dock, where she has taken on coal. The first trip will be to China.

THE tug-boat Relief, which has been overhauled at the Union Iron Works, has been materially improved. In a trial trip over the bay course this week her engineer gave her a 13½ knot rate. She could give the big tug Fearless a good hard rub in a race.

THE Yellow Jacket, Crown Point and Belcher mines have shut down, throwing about 250 men out of employment. The reason given is that the stage of water in the Carson river is too low to operate the stamp mills. The Overman will be shut down from the same cause about August 1st.

PARTIES looking for a favorable location for a starch factory have found the conditions favorable at Petaluma, Sonoma county. It will afford a fair and assured market for large or small potatoes and give new impulse to that crop. The parties interested intend to have the manufactory in running order for the crop of this fall.

BY the frachise granted the Oakland Hawyard's and San Leandro electric road Monday night, the cars will leave Twelfth avenue, East Oakland, and reach Thirteenth street in Oakland proper by way of Twelfth, Sixteenth and Third avenues and Twelfth and Oak streets. The extension will not be completed until October 1st.

THE Fulton Iron Works are considering a proposition to to go to Oakland, a tract of land on the water-front having been offered them at what they consider favorable terms. The citizens are now considering a proposition to raise a bonus of $50,000, and, in the event of their success, the new plant of the Fulton will be built across the bay.

THE California olive oil growers in addition to making a display of their product at the World's Fair have decided to make an exhibition of pure California olive oils at the Manufacturers, Dealers and Consumers' Food Exposition at Madison Square Garden in New York in October next, and at the Italian-American Exposition now being held at Genoa, and which runs until January, 1893.

A WARRANT for $1,104,000 has been prepared at the Treasury Department in payment of the San Francisco public building site, and will be signed by Secretary Foster when he receives formal notification from the Attorney-General that the title is vested in the United States. The Government will spend a large amount on the building, much to the gratification of the mechanics of this city.

UNDER the new schedule recently adopted by the Cigar Makers' Union in settling the strike was one regarding "fancy-shaped" cigars. This was the only portion of the terms of agreement which was not satisfactory to the employers, and the latter asked that it be modified. The Cigar Makers Union has instructed its Executive Committee to make the necessary changes in the matter.

THE water from the Colorado river is flowing into Salton lake, Colorado desert, San Diego Co., but it has attained only a depth of 23 inches in the deepest part of the lake. For the past week the water has been at a stand, possibly lowered a little. The varying winds make it impossible to determine any fall. The salt works are in full operation, and there is good reason to believe there will be no suspension of work.

THE Central Pacific will pay its second semi-annual dividend of one per cent on August 1st. The dividend of two per cent per annum is payable twice a year, on February 1st and on August 1st. A short spur is being built from Bailey's, near Lower Soda Springs, east toward the lower McCloud river. About three miles of grading out of the intended twenty-eight are finished. The road will open up a timber country.

THE Oakland Consolidated Street Railway Co. and the Piedmont Cable Co. are having a lively time over a franchise to Piedmont, which has been applied for by the former corporation. At a meeting of the Supervisors, a long petition was presented from property owners asking that the franchise be granted. The Piedmont people have presented a petition signed by other property owners asking that the application be denied. The Supervisors now have the subject under consideration.

OAKLAND is having quite a boom in electric railroad matters. In addition to the franchise for an extension of the Haywards road into the city, the City Council on Monday night decided to recommend that the following ordinances pass to print: To J. L. Davie et al. for a franchise for an electric road along Harrison street to Fourteenth, to Franklin, to Twentieth, to Webster, to Broadway and to the city limits; to Wells Whitmore et al. for a franchise for an electric road along Harrison street to Fourteenth, to Webster, to Broadway and thence to the city limits; to George W. McNear a franchise for an electric road on Peralta street; to Theodore Meetz et al. the right to use electricity on his street-car line to Alameda; to the East Oakland Railway Company a franchise for an electric road over certain streets in East Oakland.

BEHREND JOOST says that in about two or three weeks the San Francisco Electric Railroad will be in operation from the corner of Guerrero and 18th streets along the latter street to the old Mountain House on the hillside below the Twin Peaks. The rails are laid, and seven tons of wire will be shortly put up. The two generators to distribute the electricity are up and working smoothly, and Mr. Joost declares that all the machinery is in first-class condition, and that the road will be running within the time predicted.

JUDGE J. S. STABLER, an expert in fruit matters, says that the growers, dryers and canners of fruit in this State this year will probably make more money than in any preceding one. Last year the crop here of all deciduous fruits was phenomenally large, which, however, had to contend with the largest crop, including apples, east of the Missouri river that had been harvested during the past ten years. This year California will produce fully as many peaches as last, nearly as many apricots and nectarines, and about half as many French prunes, while the pear crop promises to be even larger, and prices this year will rule nearly twice as high as last. Ever since the organization of the California Fruit Union, facilities for shipping and marketing green fruits have been improving; refrigerator cars have become eminently successful; new markets have been opened, and the auction plan for selling fruit immediately upon its arrival in Eastern cities has worked well. Fruit growers flatter themselves that they are insured two prosperous years, as a very poor prophet could foretell that the Columbian Exposition in 1893 will be the means of greatly enhancing the consumption in that line. It is noticeable that the leading canneries are receiving orders from the East and Europe well up to their packing capacity.

California State Mining Exposition.

The State Fair for 1892 will present a feature of unusual interest, which will attract the attention of not only the miners of California, but the general public as well. It is proposed to have an exhibition specially devoted to mining, where will be shown, on as realistic a scale as circumstances will permit, the various methods for handling and working gold-bearing quartz and gravel. California manufacturers of mining machinery, and all who are engaged in the mining industry, are solicited to cooperate and unite in making this, the first event of the kind ever attempted in the history of the State, a success. It is intended that this shall form the nucleus of the California Mining Exhibit in the approaching Columbian Exposition at Chicago, and therefore will be of double importance. Some of the principal objects displayed will be rock breakers and pulverizers, various mills for reduction of quartz, amalgamating and concentrating machinery, hoisting and pumping apparatus, electrical appliances as now employed in latest improved mine-working, hydraulic machinery for direct and transmitted application of power, a general exhibit of all kinds of mining tools and supplies, and all the recent inventions in the way of automatic and labor-saving devices, either by model or actual size. Besides which a number of unique and original ideas are contemplated, which if carried out will heighten the general interest.

The exhibition is under the auspices of the State Agricultural Society, but the immediate supervision and arrangement is under a special committee, of which Mr. George M. Mott of Sacramento is chairman, and Mr. W. G. Scott of 22 Montgomery St., San Francisco, is superintendent, from either of whom all particulars can be ascertained.

A special department, covering nearly 30,000 square feet, has been set apart for the exclusive use of this mining display. The State Fair dates are from September 5th to 17th inclusive. This portion of the annual event will prove most interesting and attractive, as the interest in mining is of no small magnitude, and many of our present population have but little idea of the vastness of this industry in our State. The idea of this exhibition is to bring this grand resource more generally to the attention of the public.

THE CAMINETTI BILL.—The hydraulic mining bill, which passed the House, has been considered by the Senate Committee on Mines and Mining. Senator Felton desired to offer one or two amendments, and the Senate Committee thought the measure of too much importance to be hastily considered during the closing days of the session, so that the prospects of passing it this session are gone. The matter will be deferred until Congress again convenes.

THE bodies of Breedlove and Fish, who were prospecting in Lower California, have been found. They had evidently perished from lack of water. Young Breedlove, who was with the party, has not yet been found, but a search is being made for him.

THE Executive Committee of the Southwest Miners' Association has decided to hold its annual meeting at El Paso on December 5th, 6th, 7th and 8th.

THE business portion of the mining town of Bodie, Mono county, was burned on Tuesday, but none of the mining works were injured.

NEARLY all the Cœur d'Alene mines are being worked again by nonunion men. The troops are being withdrawn.

THE annual meeting of the Risdon Iron Works of this city takes place on Monday next.

The National Mining Congress.

Resolutions Adopted at Helena, Montana.

Full reports are now at hand of the proceedings of the National Mining Congress at Helena. Delegates were present from seventeen States, and the main topic of discussion was the silver issue. The Congress was called to order by Governor Samuel T. Hauser, and, as chairman of the Executive Committee, he presented to the delegates Hon. Champion S. Chase, of Nebraska, who had been selected as temporary chairman. This gentleman, after a brief speech, introduced Governor Joseph K. Toole, who, in an address, welcomed the delegates on behalf of the people of the State of Montana. Hon. Francis G. Newlands of Nevada responded to Gov. Toole's address of welcome. The Committe on Permanent Organization recommended the selection of Frank G. Newlands of Nevada as permanent chairman of the Congress, and he was elected. The Vice-Presidents were as follows: Arizona—A. G. Hubbard, Phœnix. California—John Daggett, Black Bear. Colorado—M. H. Slater, Denver. Idaho—Hon. Leytton Price. Illinois—S. H. Bateman. Indiana—Frank Taylor, Indianapolis. Kansas—J. R. Mead. Michigan—H. H. Pingree, Detroit. Minnesota—Capt. Frank Barrett, St. Paul. Missouri—V. M. Hines, Houston. Montana—Geo. W. Irvin, II., Butte. Nebraska—Champion S. Chase, Omaha. Nevada—James R. Shaw, Dayton. Ohio—J. W. Watt, Boonville. Oregon—J. R. Romig, La Grande. Pennsylvania—R. J. Foster. Rhode Island—M. H Keefe. Utah—J. Q. Pachart. Washington—J. F. Walgemot. Wyoming—George C. Canis.

THE SILVER RESOLUTIONS.

The report of the committee on resolutions was as follows:

The National Mining Congress now in session at Helena, Montana, comprised of delegates from 19 States and 2 Territories, having in mind the interests of the cotton planters of the South, and the wheat grower of the West, of labor, of property in all its forms, as well as the interests of the miners of the mountain States and Territories, denounce the Act of 1873, by which silver was demonetized, as a great national calamity, and they hold it to be the imperative duty of the representatives of the people now in Congress assembled, to pass without delay the bill for the remonetization of silver that has already passed the Senate.

We also declare that the responsibility for the bullion in the silver dollars now coined being of less intrinsic value than the bullion of the gold dollars, rests solely with those who remonetized silver and forced the people to accept the laws of 1878 and 1890, by which free coinage for silver has been denied and the purchase of bullion by the Government in the lowest markets of the world substituted in its stead. And we further declare our unalterable conviction to be based upon sound economic principles and the actual experience of the world between 1850 and 1860, when the relative increase in the production of gold in the United States and the rest of the world far exceeded the relative increase of silver over gold during the last decade, that the remonetization of silver by the United States at the existiog ratio will speedily restore the intrinsic value of the silver dollar to that of the gold dollar.

While we demand that the intrinsic value of the gold and silver dollar shall be equal, we protest against the test of value as to silver being made while silver money is debased and the Government is engaged under existing laws in depressing the value of the bullion by purchasing it in the lowest markets; but we shall cheerfully welcome the test and accept any change that experience shall make necessary after the full use of silver has been restored for a reasonable time through the Act now before Congress, or any similar law.

We declare free bimetallic coinage for gold and silver at the existing ratio to be the most important public question now unsettled in the United States; that there is is a lack of sound metal money upon which to do the business of the country, and upon which to base a full and fair volume of Governmental paper money, and that there are powerful and preponderating influences in the two old parties seeking ultimately to bring this country to a single gold standard, in the meantime deceiving the people with declarations in party platforms about bimetalism which are deceptive and intended in no manner to bind Presidents elected upon them to approve a free coinage law.

We urge that in every section of the country, north as well as south, the true friends of free bimetallic coinage shall make the unquestioning friendship of every candidate for any office bearing any relation whatever to legislation upon that subject as one of the chief tests of worthiness to receive their suffrages. That it is only by clearly discerning the right and acting independently and unflinchingly to undo the great wrong of silver demonetization, that the conspiracy to force the United States to the single gold standard of money can be thwarted.

[E. V. Smalley, of Minnesota, stepped to the front of the rostrum, as soon as the applause had subsided following the reading of the majority resolutions, and presented a minority report as follows:

Resolved, That we believe that the prosperity and welfare of this country and of the entire business world require the full and free use of both gold and silver as metallic money and as the basis of paper currency. The enormous increase in the commercial transactions of the world during the past ten years has made it dangerous for any nation to restrict itself to the use of one of the precious metals as a measure of values and as a foundation for its paper circulating medium. We therefore demand of our Government such wise and prompt legislative and executive action as will lead to the restoration of silver to its old place in the circulating medium and secure and maintain a parity and intrinsic value for the gold and silver coinage of the country, so that the gold dollar and the silver dollar shall be accepted as of equal purchasing power by all the nations of the earth.

Then came a long and heated discussion over the minority report, but it was finally struck out.]

The other resolutions adopted were as follows:

WHEREAS, The theory of the Constitution is that electors for President shall be men of the highest dignity and integrity, fit to be entrusted with the gravest concerns of the nation, and that they shall, when elected, be free to cast their ballots for such persons for President as will best insure the safety, honor and prosperity of the country, and

Whereas, It has been the endeavor of the opponents of bimetallic coinage to secure the selection of candidates for the Presidency by the Republican and Democratic parties who, if elected, will oppose the will of the people by the executive veto whenever Congress shall express it in a free coinage bill, and

Whereas, To vote for electors pledged in advance to select either one or the other of them for President without conditions will be an indorsement in advance of the purpose to defeat the popular will, and

Whereas, In the silver States there is but one sentiment in all the three national parties in regard to the full remonetization of silver. Therefore be it

Resolved, That wisdom and patriotism both require that the people of the silver States and the State conventions of all parties therein shall so shape their action as to secure the balance of power, if that be possible, in the Electoral College, to the end that the electors elected by the people of such States may so act independently in the Electoral College as to defeat the election of any man as President who will not agree that the will of the people, as expressed in any future act of Congress in relation to silver, shall stand without executive interference or veto.

That in order to meet the contingency of a possible election of a President by the present House of Representatives, the constituents of the members of the present House be appealed to to demand of all members of the present House who are candidates for reelection the promise that they will support no man for President who will not permit the will of the people as expressed in the future act of Congress upon the silver question to stand without executive veto.

PAN-AMERICAN CONGRESS.

Resolved, That our commercial relations with South and Central America and Mexico should be cultivated and be made more intimate; that they are the natural markets for our surplus manufactures and farm products, and that it is of mutual interest and importance that the resolution passed by the pan-American Congress, in favor of an agreement between all American nations that a uniform silver coin be adopted which shall be legal tender for all commercial transactions between all the American Governments, should be carried into effect.

MINING LAWS.

This Congress declares that the present system of national, State and local laws governing the acquisition and ownership of mining claims of gold, silver and other precious metals is unsatisfactory and productive of litigation that renders title insecure and ownership largely profitless. Therefore, it calls upon Congress to provide for a commission composed of practical miners to be aided by such legal and scientific advice as may be necessary to prepare a code of laws that will be uniform in their operation, saving all existing rights intact, and simple and clear in their operation to the end that title may be readily and cheaply acquired, rights distinctly defined and the possibility of litigation, so disastrous to the industry, reduced to a minimum.

DEPARTMENTS OF MINING.

Resolved, That the industry of mining for gold, silver, copper, lead, coal, iron, stone and all other metals has assumed such magnitude and importance that it should be placed on a plane with that of agriculture, and we urge that Congress shall by law create a bureau of mines and mining, and that its head shall be made a member of the President's cabinet.

MINERAL LANDS IN RAILROAD GRANTS.

WHEREAS, Immense areas of the mineral lands of the West, in which thousands of discovered mining properties bearing the precious metals, are within the limits of the grants of the Pacific railroads; and

Whereas, These railroad companies claim, and there is great and immediate danger of the title being confirmed in these companies to all these mineral lands on the odd numbered sections, which were not known to be valuable mineral lands at the time of the grant, although they were reserved therefrom; and

Whereas, It seems that our only sure means of relief is in congressional action. Now, therefore be it

Resolved, That this mining congress call upon the representatives of the people in Congress assembled to promptly pass such an Act as will avert this threatened danger and save this vast heritage to the people, to whom it rightfully belongs.

FIRE DAMP EXPLOSIONS.

Resolved, That the national Congress be formally and urgently requested to enact a law and make a suitable appropriation to enable the President of the United States to appoint a commission consisting of a sufficient number of mining engineers, chemists and practical mine officials, whose duties shall be to make searching scientific inquiries into the causes that lead up to the disastrous explosions of gas, dust, explosives, etc., in the mines of America.

NATIONAL PARK.

WHEREAS, There is a bill segregating and throwing open to the public a portion of the Yellowstone National Park, in order to open a practicable route to an important mining district, which bill has been passed by the Senate of the United States and has been favorably reported to the House of Representatives by its committee;

Resolved, That we respectfully urge upon the House of Representatives that this measure be taken from the calendar and passed.

Resolved, That we object to the granting of exclusive rights of way to individuals or corporations over Indian, military or public reservations, and we favor general laws granting rights of way for irrigation canals, railways and routes of public travel and conveyance.

COLUMBIAN EXPOSITION.

WHEREAS, For the first time in the history of industrial expositions, a separate and distinct department has been created by the World's Columbian exposition and a great building constructed for the adequate exhibit of universal mining and metallurgy; and

Whereas, Reports so far made public indicate that the department of mines, mining and metallurgy will in every way reflect the extensive scope of mining operations, the genius engaged and the wealth employed therein in this and other countries; therefore be it

Resolved, That the National Mining Congress congratulates the World's Columbian Exposition upon its wisdom and progressiveness in establishing the department, and congratulates the mining world upon the grand opportunity afforded for giving mining the industrial rank to which it is entitled; and be it further

Resolved, That we pledge the department of mines, mining and metallurgy of the World's Columbian Exposition our united and individual cooperation.

Resolved, That it is the sense of this congress that the World's Fair should be open to the public on Sundays.

J. R. King of Montana offered the following supplemental resolution, which was carried:

Be it Resolved, That the Executive Committee of the Mining Congress take some action looking to the holding of a conference of all the gold and silver-producing States and nations of the world, to be held at the same time and place as the international monetary conference now called, to the end that they may be prepared to use all honorable means for the remonetization of silver.

A. J. Seligman presented a resolution (which was adopted) protesting against the passage of the bill removing the duty on lead. It was in the form of a memorial to the United States Senate.

To the President of the Senate of the United States and the Senators of the United States in Session Assembled: The Second National Mining Congress of the United States in session assembled at Helena, Montana, and representing 19 States and several Territories, hereby respectfully petition your honorable body to defeat the bill known as H. R. 561, now before your honorable body, being an amendment to paragraph 199, schedule C, of the Act of October 1, 1890, and entitled "An Act to reduce the revenue and equalize duties on imports and for other purposes," and denominated the "Free Lead Ore Bill." We urge upon your honorable body the necessity of the defeat of the measure, as we feel that the passage would inevitably result in the closing down of numbers of our silver mines of which lead is the principal part, and now being operated on a very narrow margin of profit, and the consequent throwing out of employment of thousands of hard-working miners whose very existence is dependent on the continuance of operations in these properties.

The Congress, on adjournment, decided to meet at Salt Lake City, Utah, Dec. 2, 1892.

The Revised Caminetti Bill.

The Amended Hydraulic Mining Measure.

The following is the full text of the mining bill which passed the House but has been temporarily halted in the Senate:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a commission is hereby created, to be known as the California Debris Commission, consisting of three members. The President of the United States shall, by and with the advice and consent of the Senate, appoint the commission from officers of the Corps of Engineers, United States Army. Vacancies occurring therein shall be filled in like manner. It shall have the authority, and exercise the powers hereinafter set forth, under the supervision of the Chief of Engineers and direction of the Secretary of War.

SEC. 2. That said commission shall organize within thirty days after its appointment by the selection of such officers as may be required in the performance of its duties, the same to be selected from the members thereof. The members of said commission shall receive no greater compensation than is now allowed by law to each, respectively, as an officer of said Corps of Engineers. It shall also adopt such rules and regulations, not inconsistent with law, to govern its deliberations and prescribe the method of procedure under the provisions of this act.

SEC. 3. That the jurisdiction of said commission, in so far as the same affects mining carried on by the hydraulic process, shall extend to all such mining in the territory drained by the Sacramento and San Joaquin river systems. Hydraulic mining, as defined in section eight hereof, directly or indirectly injuring the navigability of said river systems, carried on in said territory other than as permitted under the provisions of this act, is hereby prohibited and declared unlawful.

SEC. 4. That it shall be the duty of said commission to mature and adopt such plan or plans, from examination and surveys already made, and from such additional examinations and surveys as it may deem necessary, as will improve the navigability of all the rivers comprising said systems, deepen their channels, and protect their banks. Such plan or plans shall be matured with a view of making the same effective as against the encroachment of and damage from debris resulting from mining operations, natural erosion or other causes, with a view of restoring, as near as practicable and the necessities of commerce and navigation demand, the navigability of said rivers to the condition existing in eighteen hundred and sixty, and permitting mining by the hydraulic process, as the term is understood in said State, to be carried on without injury to the navigability of said rivers or the lands adjacent thereto.

SEC. 5. That it shall further examine, survey and determine the utility and practicability, for the purposes hereinafter indicated, of storage cites in the canyons and tributaries of said rivers and in the respective branches of said tributaries, or in the plains, basins, sloughs and tule and swamp lands adjacent to or along the course of said rivers, for the storage of debris or water or as settling reservoirs, with the object of using the same by either or all of these methods in aid of the improvement and protection of said navigable rivers by preventing deposits therein of debris resulting from mining operations, natural erosion, or other causes, or for affording relief thereto in flood time and providing sufficient water to maintain scouring force therein in the summer season; and in connection therewith to investigate such hydraulic and other mines as are now or may have been worked by methods intended to restrain the debris and material moved in operating such mines by impounding dams, settling reservoirs, or otherwise, and in general to make such study of and researches in the hydraulic mining industry as science, experience and engineering skill may suggest as practical and useful in devising a method or methods whereby such mining may be carried on as aforesaid.

SEC. 6. That the said commission shall from time to time note the conditions of the navigable channels of said river systems, by cross-section surveys or otherwise, and observe the effect thereon of such hydraulic mining operations as may be permitted by its orders.

SEC. 7. That said commission shall submit to the Chief of engineers, for the information of the Secretary of War, on or before the 15th day of November of each year, a report of its labors and transactions, with plans for the construction, completion and preservation of the public works outlined in this act, together with estimates of the cost thereof, stating what amounts can be profitably expended thereon each year. The Secretary of War shall thereupon submit same to Congress on or before the meeting thereof.

SEC. 8. That for the purposes of this act "hydraulic mining" and "mining by the hydraulic process" are hereby declared to have the meaning and application given to said terms in said State.

SEC. 9. That the owner or owners, or in the case of a corporation its manager or agent appointed for that purpose, owning mining ground in the territory in the State of California mentioned in section three hereof, which it is desired to work by the hydraulic process, may file with said commission a verified petition, setting forth such facts as will comply with the rules prescribed by said commission.

SEC. 10. That said petition shall be accompanied by an instrument duly executed and acknowledged, as required by the law of the said State, whereby the owner or owners of such mine or mines surrenders to the United States the right and privilege to regulate by law, as provided in this act, or any law that may hereafter be enacted, or by such rules and regulations as may be prescribed by virtue thereof, the manner and method in which the debris resulting from the workings of said mine or mines shall be restrained, and what amount shall be produced therefrom, it being understood that the surrender aforesaid shall not be construed as in any way affecting the right of such owner or owners to operate said mine or mines by any other process or method now in use in said State.

SEC. 11. That the owners of several mining claims situated so as to require a common dumping ground or dam or other restraining works for the debris issuing therefrom in one or more sites may file a joint petition setting forth such facts in addition to the requirements of section nine; and where the owner of a hydraulic mine or owners of several such mines have and use common dumping sites for impounding debris or as settling reservoirs, which sites are located below the mine of an applicant not entitled to use same, such fact shall also be stated in his petition. Thereupon the same proceedings shall be had as provided for herein.

SEC. 12. A notice specifying briefly the contents of said petition and fixing a time previous to which all proofs are to be submitted shall be published by said commission in some newspaper or newspapers of general circulation in the communities interested in the matter set forth therein. If published in a daily paper, such publication shall continue for at least five days; if in a weekly paper, in at least two issues of the same. Pending publication thereof said commission, or a committee thereof, shall examine the mine and premises described in such petition. On or before the time so fixed all parties interested, either as petitioners or contestants, may file affidavits, plans and maps in support of their respective claims. Further hearings, upon notice to all parties of record, may be granted by the commission when necessary.

SEC. 13. That in case a majority of the members of said commission, within thirty days after the time so fixed, concur in a decision in favor of the petitioner, the said commission shall thereupon make an order directing the methods and specifying in detail the manner in which operations shall proceed in such mine or mines; what restraining or impounding works, if facilities therefor can be found, shall be built and maintained; how and of what material; where to be located; and in general set forth such further requirements and safeguards as will protect the public interest and prevent injury to the said navigable rivers, with such further conditions and limitations as will observe all the provisions of this act in relation to the working thereof and the payment of taxes on the gross proceeds of the same: *Provided*, That all expense incurred in complying with said order shall be borne by the owner or owners of such mine or mines.

SEC. 14. That such petitioner or petitioners must within a reasonable time present plans and specifications of all works required to be built in pursuance of said order for examination, correction and approval by said commission; and thereupon work may immediately commence thereon under the supervision of said commission or representative thereof attached thereto from said Corps of Engineers, who shall inspect same from time to time. Upon completion thereof, if found in every respect to meet the requirements of the said order and said approved plans and specifications, permission shall thereupon be granted to the owner of such mine or mines to commence mining operations, subject to the conditions of said order and the provisions of this act.

SEC. 15. That no permission granted to a mine owner or owners under this act shall take effect, so far as regards the working of a mine, until all impounding dams or other restraining works, if any are prescribed by the order granting such permission, have been completed and until the impounding dams or other restraining works or settling reservoirs provided by said commission have reached such a stage as, in the opinion of said commission, it is safe to use the same: *Provided, however*, That if said commission shall be of the opinion that the restraining and other works constructed at the mine or mines shall be sufficient to protect the navigable rivers of said system and the work of said commission, then such mine or mines may be permitted to commence operations.

SEC. 16. That in case the joint petition referred to in section eleven hereof is favorably acted upon, the commission shall fix the respective amounts to be paid by each owner of such mines toward providing and building necessary impounding dams or other restraining works. In the event of a petition being filed after the entry of such order, or in case the impounding dam or dams or other restraining works have already been constructed and favorably considered, the commission shall fix such amount as may be reasonable for the privilege of dumping therein, which amount shall be divided between the original owners of such impounding dams or other restraining works in proportion to the amount respectively paid by each party owning same. The expense of maintaining and protecting such joint dam or works shall be divided among mine owners using same in such proportion as the commission shall determine. In cases where it is practicable, restraining and impounding works are to be provided, constructed and maintained by mine owners near or below the mine or mines before reaching the main tributaries of said navigable waters.

SEC. 17. That at no time shall any more debris be permitted to be washed away from any hydraulic mine or mines situated on the tributaries of said rivers and the respective branches of each, worked under the provisions of this act, than can be properly cared for at or below said mine or mines, as per order of said commission, or by the restraining works erected in accordance with the directions of this act by said commission.

SEC. 18. That the said commission may at any time, when the condition of the navigable rivers or when the capacities of all impounding and settling facilities erected by mine owners or such as may be provided by Government authority require same, modify the order granting the privilege to mine by the hydraulic mining process so as to reduce amount thereof to meet the capacities of the facilities then in use, or if actually required in order to protect the navigable rivers from damage, may revoke same until the further notice of the commission.

SEC. 19. That an intentional violation on the part of a mine owner or owners, company or corporation, or the agents or employes of either, of the conditions of the order granted pursuant to section thirteen, or such modifications thereof as may have been made by said commission, shall work a forfeiture of the privileges thereby conferred, and upon notice being served by the order of said commission upon such owner or owners, company or corporation, or agent in charge, work shall immediately cease. Said commission shall take necessary steps to enforce its orders in case of the failure, neglect or refusal of such owner or owners, company or corporation, or agents thereof, to comply therewith, or in the event of any person or persons, company or corporation working by said process in said territory contrary to law.

SEC. 20. That said commission, or a committee therefrom, or officer of said corps assigned to duty under its orders, shall, whenever deemed necessary, visit said territory and all mines operating under the provisions of this act. A report of such examination shall be placed on file.

SEC. 23. That the said commission is hereby granted the right to use any of the public lands of the United States, or any rock, stone, timber, trees, brush or material thereon or therein, for any of the purposes of this act; and the Secretary of the Interior is hereby authorized and requested, after notice has been filed with the Commissioner of the General Land Office by said commission, setting forth what public lands are required by it under the authority of this section, that such land or lands shall be withdrawn from sale and entry under the laws of the United States.

SEC. 24. That any person or persons who willfully or maliciously injure, damage or destroy, or attempt to injure, damage or destroy, any dam or other work erected under the provisions of this act for restraining, impounding or settling purposes, or for use in connection therewith, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not to exceed the sum of five thousand dollars or be imprisoned not to exceed five years, or by both such fine and imprisonment, in the discretion of the court.

SEC. 25. That upon the construction by the said commission of dams or other works for the detention of debris from hydraulic mines and the issuing of the order provided for by this act to any individual, company or corporation to work any mine or mines by hydraulic process, the individual, company or corporation operating thereunder working any mine or mines by hydraulic process, the debris from which flows into or is in whole or in part restrained by such dams or other works erected by said commission, shall pay a tax of three per centum on the gross proceeds of his, their or its mine so worked, which tax of three per centum shall be ascertained and paid in accordance with regulations to be adopted by the Secretary of the Treasury. All sums of money paid into the Treasury under this section shall be set apart and credited to a fund to be known as the debris fund, and shall be expended by said commission under the supervision of the Chief of Engineers and direction of the Secretary of War, in addition to the appropriations made by law in the construction and maintaining of such restraining works and settling reservoirs as may be proper or necessary: *Provided*, That said commission is hereby authorized to receive and pay into the Treasury from the owner or owners of mines worked by the hydraulic process, to whom permission may have been granted so as to work under the provisions hereof, such money advances as may be offered to aid in the construction of such impounding dams or other restraining works, or

settling reservoirs, or sites therefor, as may be deemed necessary by said commission to protect the navigable channels of said river systems, on condition that all moneys so advanced shall be refunded as the said tax is paid into the said debris fund: *And provided further*, That in no event shall the Government of the United States be held liable to refund same except as directed by this section.

SEC. 26. That the said commission, in order to secure harmony in work to be constructed for reclamation and drainage purposes on said river systems, with present plans of river conservation, or with such plans as may hereafter be adopted as provided by this act, having in view their protection from the encroachment of mining debris or other material, and to promote efficiency and economy, is empowered to consult thereon from time to time with a commission of engineers authorized to join such conference by the laws of the State of California. The result of such conferences shall be reported to the Chief of Engineers for transmission to Congress. The consent of the United States, in so far as it is necessary to confer same on account of its reserved control over said navigable rivers, is hereby granted to the State of California, or any municipal or local organization authorized by the laws of said State, to construct such works at its expense: *Provided*, That whenever the navigable waters of said systems are, or may be, affected thereby, the plans therefor shall be recommended by the commission created by this act and approved by the Chief of Engineers, United States Army.

SEC. 27. That said commission, in order that such material as is now, or may hereafter be, lodged in the tributaries of the Sacramento and San Joaquin river systems resulting from mining operations, natural erosion or other causes, may be prevented from injuring the said navigable rivers or such of the tributaries of either as may be navigable, is hereby directed and empowered, when appropriations are made therefor by law, or sufficient money is deposited for that purpose in said debris fund, to build at such points above the head of navigation in said rivers and on the main tributaries thereof, or branches of such tributaries, or at any place adjacent to the same, or at any point calculated, in the judgment of said commission, to effect said object (the same to be of such material as will insure safety and permanency), such restraining or impounding dams and settling reservoirs, with such canals, locks or other works adapted and required to complete same. The recommendations contained in Executive Document Numbered Two Hundred and Sixty-seven, Fifty-first Congress, second session, and Executive Document Numbered Ninety-eight, Forty-seventh Congress, first session, as far as they refer to impounding dams, or other restraining works, are hereby adopted, and the same are directed to be made the basis of operations. The sum of dollars is hereby appropriated, from moneys in the Treasury not otherwise appropriated, to be immediately available, to aid in maturing plans and in the building and construction of such works and the acquirement of sites therefor where necessary so to do: *Provided*, That not more than 15,000 dollars be expended to defray the expenses of said commission.

The Mines of Butte County.

The Bangor Blue Lead.—Gravel and Quartz Claims.

FORBESTOWN, July 23, 1892.

TO THE EDITOR:—A few weeks ago a prominent mining man remarked to the writer: "Six months since I knew of at least 25 mills in Butte county and the immediate mining vicinity which their owners were but too anxious to dispose of at any price. To-day I know of scarcely one for sale. Some have changed hands, but in most cases those who have mills, or mining properties in general, have decided to hold on to them." And this disposition to renewed interest in mining is generally observable throughout the county.

A month ago, when I visited this part of the State, several projects which were being talked of, or newly starting, have now assumed practical shape. It seems as if the capital which had lain idle awaiting the resumption of hydraulicking had become discouraged or disgusted, as far as Butte county is concerned, and sought a new investment. This has led to the erection of mills, the development of many old abandoned or half-worked claims, or of entirely new ones, and encouraged to further activity those mines already working. A desire to see legitimate mining once more succeed is generally prevalent, and those who are now investing seem to be doing so with that aim in view.

The "Bangor Blue Lead" is the district attracting by far the greatest attention at present. Three mines are in operation, or will very shortly be, and two others will soon be opened. The town has assumed an appearance of activity that it has not known in years.

The "lead" has been worked in a more or less desultory manner for the past 25 years, though it was known to be a profitable field. The character of the gold-bearing material is, as the name implies, a cement gravel, belonging to an ancient river channel. This channel is plainly traceable a distance of six miles or more westward from Bangor to the old mining camp of Kentucky Ranch.

The first claim to be opened and get in operation was the Catskill, owned by 11 Marysville capitalists and farmers. They have tapped the channel on the south rim with a 140-foot shaft. From this they have run a main gangway in about 175 feet, and two side drifts of 50 feet each. At present the company claims to be in a very rich streak, with prospects bettering steadily. They have run in this pay dirt 90 feet across the channel without reaching the other side. The last cleanup amounted to $1500 for a 10-days' run which, under the present unsatisfactory plant, is a remarkable showing.

One arrastre and a threshing engine are doing the work, but it is the intention shortly to erect hoisting works, put in stationary engines, four arrastres and sink another shaft about 100 feet west of the present building. Twenty-six men are regularly employed.

Mr. Campbell, an experienced mining man, is superintendent, and the success of the mine is largely due to his efforts.

W. W. Will of Oroville has the property known as the old Bishop mine. For a year or so he has been prospecting, and, evidently satisfied with that, has put up hoisting works, an 11-foot arrastre, engines, steam pump, etc.

THE BLUE AND GOLD.

The Blue and Gold mine of Hay & Clark is, however, the one on which attention is particularly centered, and of which great things are expected. Though young men, they have gone to work in a business-like manner. They purchased, some two months ago, the complete plant of the old Golden Eagle Mining Company of Mineral Slide. This has all been removed to Bangor, and they are now busily at work putting the 20 stamps in position, and, in another month, expect to be running a hundred tons a day through their mill. Their experiment will be watched with keen interest, for it is to settle the question of superiority of stamps over arrastres on the blue gravel of Bangor. The other claims are firm in their faith in the sole adaptability of the arrastre and in the inevitable failure of the stamps. Messrs. Hay & Clark studied the situation thoroughly before their final decision, and investigated carefully all the methods in use.

The mine is known as the Potter claim and lies east of and adjoining the Bishop mine. There are two shafts, one 78 feet, the other 130 feet, and connected by a tunnel, which gives splendid ventilation. From the western and deeper shaft runs a shaft 200 feet farther into the hill. The prospect bids very fair. These gentlemen have also a claim on the Kentucky ranch end of the lead, in conjunction with Capt. Smith of Oakland. Here they have run a cut 120 feet, and a tunnel 70 feet across the channel. If this property gives promise, they will put a mill up to be run by water power.

Two Marysville companies have been formed to work other mines on the lead. One has begun cleaning out the shaft on the Turner claim east of the Blue and Gold mine. The other has what is known as the Johnson property, lying between the Catskill and Bishop mines. They have but recently formed, and have not given their plans to the public.

On the road from Bangor to Forbestown, one passes two Yuba county mines worthy of mention. The five-stamp mill of R. M. Johnson is three miles beyond Hansonville. This is at a small mine, with a 75-foot shaft, on a fair-paying ledge of quartz. It has been running steadily all spring. Alvinza Hayward is said to be negotiating for a bond of this property.

At Brownsville the only claim in operation is the Clark mine, J. C. Campbell superintendent. A ten-stamp mill was erected last fall, and has run steadily all this season. Power is generated by a 44-inch Pelton wheel under a 60-foot head, and is transmitted by a wire cable, 200 yards to the mill, giving complete satisfaction. The ore is taken from a ledge varying from two to eight feet in width, with general direction north and south, and dipping to the east. The tunnel is in 900 feet. It is intended to sink a lower shaft to the 280 foot level and tap the ledge at that depth. The ore runs heavily in sulphurets averaging $260 to the ton, with only about 30 per cent of the gold as free. This, consequently, necessitates treatment of the sulphurets, and it is intended shortly to build reduction works in connection with the mill. Mr. Campbell is making a number of interesting experiments with the cyanide process.

At Forbestown, besides a number of small claims, two large mines are in operation, giving employment to about 70 men. The Shakespeare mine was taken charge of by Alvinza Hayward about a year ago under bond from Messrs. C. F. Belding, Chas. Nickerson and H. E. Vail. Mr. Geo. Price, a young man and an experienced miner, is superintendent. Under Mr. Price, an incline has been sunk down the ledge to a depth of 260 feet, with a level at 240 feet, from which run north and south drifts. The north drift strikes the pay chute, and it is intended to extend the south one to form an adit and give a drainage. Last fall a ten-stamp mill was erected about 150 yards below the hoisting works. It has not been in operation, however, except for a prospect run of 500 tons of ore from the 240-foot level. The mill is run by a Knight wheel, and as soon as new hoisting works are built, it will be started up. The ore will be conveyed from the mine to the mill by a wire ropeway. It was the first intention to run down 1000 feet before beginning crushing, but work will probably be commenced before then.

A brick kiln is being built, preparatory to the erection of chlorination works.

The Gold Bank mine, the property of W. W. Stow, of San Francisco, has been running 20 stamps steadily for the past five years. During that time the vein has been developed by an incline which has reached a depth of 365 feet, and by three levels. At 65 feet a drift extends west 800 feet and east 300 feet, the general direction of the ledge being northeast and southwest. Level No. 2 at 100 feet has an east drift in 150 feet, in which they are now working. The west drift extends 300 feet. Level No. 3 is at 365 feet, the present bottom of the incline. Drifts have been run here east and west, 70 and 150 feet respectively.

Mr. H. P. Stow, the superintendent, is reserved in his statements regarding the paying qualities of the mine. I understand that an especially rich strike has been made in the past few days. That the mine is doing well may be judged from the fact that the mill is being enlarged to receive 20 more stamps. Mr. Stow said there was enough ore in sight to keep the 40 stamps going for another five years. New hoisting works are also in course of erection. An extensive chlorination plant is run in conjunction with the mill.

The 10-stamp mill of Mr. Chas. Nickerson on the Golden Queen mine has been shut down for several months, but for what reason has not been made public.

It was not until recently that attention was turned to quartz mining in this section, though many ledges were known to exist that carried more or less gold. The closing down, however, of hydraulicking forced attention toward this branch of mining; but milling has proven too expensive a process to most of those who have quartz locations, though they were previously hydraulicking to some advantage. This is one section where the enforced idleness of monitors has worked not only serious injury to their owners, but decided injustice. There were no large destructive claims and many small, profitable ones, while the character of the tailings and the nature of the country were such that little sediment reached the rivers, or was ever carried into the valley. The farther one goes into the mountains the more serious appears the effect of the prevention of hydraulicking. The justice, to a certain extent, of the farmers' demands is recognized by the miners, and hopes of an amicable settlement are still entertained, though they are admittedly growing fainter.

RIVER MINING.

At Colonel McLaughlin's Golden Feather mine, the whole of the Feather river has been turned into the canal. The foot dam will be put in immediately, and as soon as that is completed the river channel will be pumped out and the actual work of mining the gravel in its bed begun. The final success of this scheme will be watched with considerable interest, as immense sums of money have been expended in building the dams and the great canal or flume which drains the river for over a mile.

In Morris ravine, three miles above Oroville, a number of small claims are being worked to good profit. J. C. Potter, Joe Henley and John Wagner have gravel mines of considerable promise. In washing the tailings lately, Mr. Wagner cleaned up six ounces of coarse gold, including two nuggets of two ounces each, in a single afternoon.

ON JORDAN HILL,

Near Deadwood, 25 miles above Oroville, are two promising mines. The Rainbow mine is the property of Capt. Griffiths of San Francisco and is under the superintendence of I. J. Houghton, lately connected with the Brown Bear mine. A five-stamp mill is about completed and a good body of quartz has been exposed. During the past few months, besides putting in the mill, Mr. Houghton has been busily engaged digging a ditch, three miles in length, and in straightening and timbering the shaft, which is down about 100 feet.

Adjoining the Rainbow is the Paxton mine. Mr. Paxton is at present clearing out an old tunnel, which taps the ledge 640 feet in and runs along the vein 300 feet. Owing to poor ventilation, he has found it necessary to sink a shaft down on the ledge and connect with the tunnel. Machinery for a ten-stamp mill is now on the spot and will shortly be put in position. The ledge is generally traceable and where it has been developed shows a prospect of from $5 to $10 per ton. The same ditch that runs to the Rainbow mine will furnish water to develop the power for Mr. Paxton's Pelton wheel.

MAGALIA RIDGE.

One passes beyond the Jordan to Paradise, which, in Butte county, is on Poverty ridge, over against Dogtown and in the Helltown mining district. Here, on what is generally known as the Magalia ridge, are several mines in operation, the principal among which is the Mineral Slide Consolidated. This is owned by Col. McLaughlin and Mr. Nickerson of Oroville and S. V. Moody, the latter also being superintendent, and under whom the mine has made its richest developments. The gravel in places has run very high.

During the heavy rains of this spring, work was greatly impeded by the continual slides and caves and the settling of the mountain. Within the past month, though, about 50 men have been put at work and five tunnels are now opened. The longest, at the south end, is in 1200 feet and drains the entire ridge. In order to obviate the danger of caves, which hitherto have been a source of great hindrance as well as a menace to the lives of the miners, a bedrock tunnel is being driven, from which the mine in future will be worked by upraise. This is now in over 200 feet.

Across Little Butte creek from this mine is the Eureka, which has been a very rich paying mine, but at present is in the hands of lien holders who are doing the work in a desultory manner. A settlement is likely, however, soon to take place by which the mine will again be put in proper shape.

South of the Eureka is the claim of the Wylie Bros. For three years they have been driving a tunnel under the lava capping, hoping to tap the great "Mammoth channel," which, by arguments unique and highly plausible, they claim must lie somewhere along the ridge into which they are working. They are now in 1400 feet, and are pushing farther ahead confidently, despite the numerous incredulous shakes of the head of many who look upon them as foolhardy visionaries.

Bader Bros. have leased their claim below Magalia, or Dogtown as it is more generally known, to a Chico gentleman, who is preparing to clean out the old tunnel and begin sluicing.

East of Paradise about four miles, and in the same district as the foregoing mines, is the Lewis or Durgin mine. A tunnel has been driven, and splendid prospects are known to have been found. Mr. Lewis expressed himself as perfectly satisfied with what he has. Above this is the Mossback mine of Messrs. Knox, Lowe, Pierson & Banning, who have run two tunnels into the ridge, hoping to strike the pay channel. At present they are running through a hard quartzite formation, but, judging by the showing of adjacent mines, they hope soon to strike pay gravel.

The famous Perschbacker mine above Magalia is still idle. This has proven fabulously rich as far as it has been possible to work it, but no means have yet been found to cope satisfactorily with the vast quantities of water that pour into the mine continually. Various schemes are talked of, such as running a tunnel from Big Butte creek, a distance of five miles, to drain the whole ridge. The impracticability of this scheme is patent on the face. Another is to sink a shaft at the lower end of the claim and through the lava capping, and thus offer an opening to the channel. But this, while it seems the only way, is scarcely practicable, owing to the uncertainty of the course of the channel, which is very narrow and tortuous where it has been developed; and the sinking of a shaft would be but guesswork. Such guessing is highly expensive, too.

I am told there are many mines working above Dogtown and about Minshew, Lovelock and Powelton. Prospectors are out in every direction, and every miner one meets has a claim he is working or waiting to find means to develop.

The one drawback to the hopefulness of the miner of today seems to be the low rate of wages prevailing. Three dollars a day is considered good pay, and two and a half is the general average, while in places wages are as low as two dollars a day. An improvement is hoped for as the mines are further developed and show results which would warrant an advance.

TOWNSEND.

MECHANICAL PROGRESS.

Nicks in Metal.

The statement is sometimes made that, owing to the homogeneity of steel, a bar of this metal with a surface crack or nick in one of its edges is liable to fail hy the gradual spreading of the nick, and thus break under a very much smaller load than a sound har. With iron, it is contended this does not occur, as this metal has a fibrous structure. Even the late Sir William Siemens supported this theory, and likened a har of steel to one of indiarubher, which, as everyone knows, is greatly weakened hy a nick in one of its edges. Sir Benjamin Baker has, however, shown that this theory, at least so far as statical stress is concerned, is opposed to the facts, as he purposely made nicks in specimens of the mild steel used at the Forth hridge, hut found that the tensile strength of the whole was thus reduced by only about one ton per square inch of section. This settled the matter so far as statical stresses are concerned, and we now find in a recent numher of *Engineering News* an account of an experiment carried out hy the Union Bridge Company, in which a full-sized steel counter har, with a screw-turned huckle connection, was tested under a heavy statical stress, and at the same time a weight weighing 1040 pounds was allowed to drop on it from various heights. The har was first hroken by ordinary statical strain, and showed an ultimate breaking stress of 66,800 pounds per square inch, with an elongation of 29.17 per cent on 12 inches. The reduction of area at fracture was 52.4 per cent. The longer of the hroken parts was then placed in the machine and put under the following loads, while a weight, as already mentioned, was dropped on it from various heights at a distance of five feet from the sleeve nut of the turn buckle as shown below: .

Stress in lbs. ₱ sq. in.	50,000	55,000	60,000	63,000	65,000
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
Height of fall	2 1	2 6	3 0	4 0	5 0

The weight was then shifted so as to fall directly on the sleeve nut, and the test proceeded as follows:

Stress on specimen in lbs. ₱ sq. in.	65,350	65,350	63,800
	ft.	ft.	ft.
Height of fall	3	6	6

It will be seen that under this severe trial the har actually carried more than when originally tested statically, showing that the nicking of the bar hy screwing had not appreciahly weakened its power of resisting shocks.

Orderly Shops and Good Tools.

There are few mechanics who realize the importance of keeping their tools in perfect order, says an exchange. Nevertheless, the experience of every one having to work with a set of tools ought to prove that he should love his tools and regard them with pride. We scarcely recollect a single instance of a really good workman who did not possess this affection for, and pride in, the implements which enahled him to turn out his work well.

If hammers are rusty and with faces covered with careless nicks, and fitted with ill-shaped and broken handles; if sharp-edged tools are badly ground and covered with rust; if cold chisels are made very much like old shanks taken at random from the scrap pile, and litter, dirt, tools and fragments are clustered together in a close conglomeration, it will convey about the same idea to the ohserver that a heggar in tattered habilments would in the parlor of a prince. Every one would feel a great desire to either eject the intruder from the apartment or at once leave the place himself. There are instances where this affection for, and pride in implements have gone extremely far and become almost a monomania—so much so that the journeyman could scarcely bear to see you examining his chisels, files, etc., and seemed to have a fear, while you were looking at them, of some outward effect like that which the Indians attrihute to an evil eye, hut which merely arose from a species of selfish affection for these children of his handicraft.

Every tool should have a place and he kept there when not in use. The amount of time saved in a year hy having everything in order is astonishing. It often happens that when a joh is to he done in a hurry, there is more time wasted looking for tools than would he required to do the joh. This does not pay, and, hesides, the customer goes away in an unpleasant condition of mind, and will not be apt to take another joh to that shop if he can help it; hut he will be almost glad of the opportunity of visiting the shop where work is done promptly and pleasantly. The people soon find out the best shop to deal at, and the best shop gets the cream of the trade, while the old fogies growl and grumble while the dust is settling on them, which they are too lazy to shake off.

I have known men starting in business in towns where there did not seem a ghost of a chance for them to succeed, yet in a short time they were doing a prosperous husiness. They would never have done so if they had not done their work well and paid proper attention to their husiness; or, in other words, they did everything in an orderly manner.

In some shops, cuttings of lumber are all mixed together in one pile, and much time is lost in looking for pieces of certain size. The result is that a whole hoard or piece is cut into, just because they did not have time to look up pieces, when if the pieces had heen handy they could have been used. In these days, when competition is sharp, it is very important to consider these things. There are many shops in this country that do not pay just because everything is done in such a disorderly manner.

CHROME STEEL TURRETS.—The chrome steel turret invented a short time ago hy a French navy officer is said to he a great improvement over previous conning towers. In its design, the inventor has endeavored to avoid the weak spots that render others of a similar character practically worthless. Instead of merely revolving or disappearing by the aid of machinery, an operation which exposes the apertures to the enemy's fire, the new cupola swings, pendulum fashion, upon a horizontal axis for ten degrees. This is accomplished by means of a counterpoise, weighing 24 tons, which is easily kept under the control of one man. Friction is reduced hy a rolling motion. A cylinder under the revolving part fits into another cylinder, of which the surface is partly concave. When it is required to fire the guns, the cupola is brought round to the desired point, and after the discharge it swings hack by itself, thus putting the apertures out of sight of the enemy. The whole operation of swinging only occupies five seconds, and during two seconds only are the apertures exposed to fire. The mechanism of the cupola is said to be very ingenious, hut the details are, of course, kept a close secret. The French firm manufacturing this turret first supplied a number to the Belgian Government, which has used them in the fortification of the Meuse. It is now executing an order for 29 on account of the Roumanian Government, for the defense of Bucharest, and it is stated that the French Government contemplates ordering 30.—Manufacturers' Gazette.

OLD RAILROAD IRON FOR BRIDGES. Something of a new departure in the utilization of old railroad iron is noted in the construction of a highway bridge across the Pequabuck river at Terryville, Ct. It is a truss bridge, having a span of 19 feet and a width of 38 feet, and rests upon stone abutments, on each of which an iron rail rests and forms the sills, upon which the "strings," which are also old iron rails, are laid, there being of these 15 in this bridge, placed at equal distances. Another rod or spindle across the center, under and at right angles with the stringers, is supported by iron rods depending from the trusses, which also support the bridge. Each of the trusses is formed by two rails, the ends of which are fitted into solid iron castings made of especial shape to receive them, and meeting at the center of the bridge are also held together hy similar castings, through which the iron rod extends, and hraces extending on either side to the end of the spindle give strength as well as rigidity to the structure, comparing favorahly as to these qualities with hridges of considerably greater cost. Heavy planks covered with a concrete pavement form the floor.

ONE of the latest products of American skill and ingenuity is the new form of machine for cleaning and polishing shoes. It consists of a strong platform, with a supporter for the person's body, while in the center of the frame are two openings into which the shoes are received. After the feet are in place shields are applied, surrounding the upper part of the shoe, and preventing the hlacking from getting on this portion of of the footgear. The brushes, which consist of four arranged vertically for the side of the foot and two working horizontally for the heel and toe, are then set in motion hy steam power. First the shoes are polished, then the hlacking, taken from movable hoxes hy an automatic device, is applied, and afterward the polishing is finished. According to the St. Louis *Republic*, the inventor looks forward to a great future for his labor-saving device, notwithstanding that the trade is at present largely in the hands of foreigners, who are not given to a consideration of mechanical devices.

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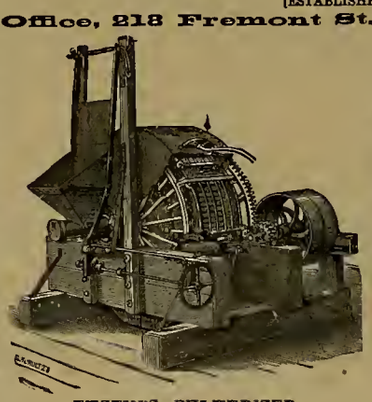
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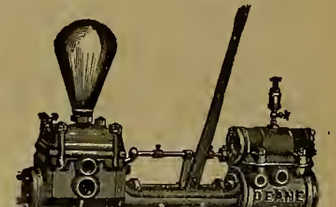
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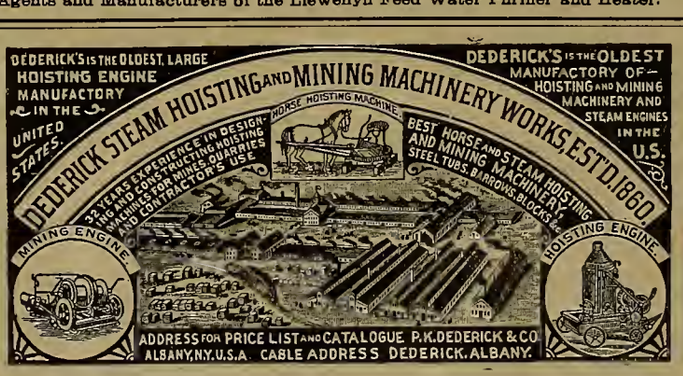
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Abstract of Contents.

I. GENERAL HISTORICAL PART. CHAPTER I, HISTORICAL REVIEW OF ELECTRO-METALLURGY. II. THEORETICAL PART. CHAPTER II. MAGNETISM AND ELECTRICITY. 1. Magnetism. II. Electricity; Electro-Magnetism; Induction; Chemical Actions of the Electrical Current—Electrolysis. III. SOURCES OF CURRENT. CHAPTER III. GALVANIC ELEMENTS; THERMO-PILES; MAGNETO AND DYNAMO ELECTRIC MACHINES. IV. PRACTICAL PART. CHAPTER IV. ARRANGEMENT OF ELECTRO-PLATING ESTABLISHMENTS IN GENERAL; ELECTRO-PLATING ARRANGEMENTS IN PARTICULAR. V. TREATMENT OF THE METALLIC ARTICLES. (a) Mechanical Treatment; (b) Chemical Treatment. VI. PROCESSES OF ELECTRO-DEPOSITION; REDUCTION OF METALS WITHOUT A BATTERY (Electro-Deposition by Contact). VII. DEPOSITION OF NICKEL AND COBALT. I. Nickeling. 2. Cobalting. VIII. DEPOSITION OF COPPER, BRASS AND BRONZE. 1. Coppering; 2. Brassing (Cuivrepoll Deposit); 3. Broozing. IX. DEPOSITION OF SILVER. X. DEPOSITION OF GOLD. XI. DEPOSITION OF PLATINUM AND PALLADIUM. 1. Deposition of Platinum; 2. Deposition of Palladium. XII. DEPOSITION OF TIN, ZINC, LEAD AND IRON. I. Deposition of Tin. 2. Deposition of Zinc; 3. Deposition of Lead; 4. Deposition of Iron (Steeling). XIII DEPOSITION OF ANTIMONY, ARSENIC AND ALUMINUM. 1. Deposition of Antimony; 2. Deposition of Arsenic; 3. Deposition of Aluminum. XIV. GALVANOPLASTY (Reproduction). 1 Galvanoplastic Deposition in the Cell Apparatus; 2. Galvanoplastic Deposition by the Battery and Dynamo Machine. XV. COLORING, PLATINIZING, OXIDIZING, ETC., OF METALS, LACQUERING. XVI. APPARATUS AND INSTRUMENTS. XVII. HYGIENIC RULES FOR THE WORKSHOP. XVIII. CHEMICAL PRODUCTS USED IN THE ELECTRO-PLATING ART. XIX USEFUL TABLES INDEX.

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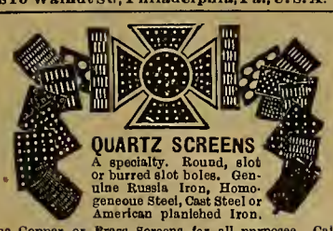

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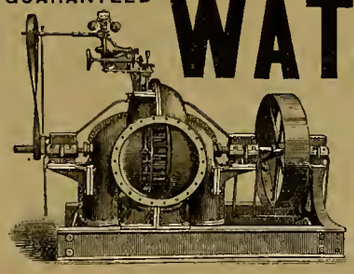

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For more than a century the Leblanc process for making soda ash and salt cake held undisputed sway. In this process, as is well known, sulphate of soda, black ash or salt cake, as the product is called, is made from salt by the action of sulphuric acid upon it. This sulphate is changed into soda ash or carbonate of soda by the action of powdered carbon, usually in the form of charcoal and heat. A few years ago the ammonia soda process was invented. No sulphate or black ash is made; the salt is converted into carbonate by the action of ammonia.

For a while the ammonia process made rapid strides, and it seemed as though it would entirely supplant the older and more expensive Lablanc process. The competition was so fierce that the Leblanc soda ash was for many months sold below cost, while the ammonia soda makers were not losing money. The Leblanc people only saved themselves from bankruptcy by the sale of salt cake, and certain by-products that were not made by the ammonia process.

In the last three years, however, in Great Britain, at least, the Leblanc process has more than held its own, as will be seen from the following table showing the salt decomposed in Great Britain in 1889 to 1891 by each of these two processes:

Salt decomposed in the Leblanc and ammonia soda processes in Great Britain 1889–1891, in tons of 2240 lbs.:

	1891.	1890.	1889.
Leblanc process	567,863	602,769	584 203
Ammonia process	278,528	252,260	219,279
Total	846,391	855,029	803,482

One reason why the Leblanc process has held its own is the demand for sulphate or black ash by the glassmaker. It has been found that as good, if not better results, have been obtained by using salt cake and carbon in the glass pot instead of the soda ash. The same reaction takes place in the pot between the carbon and salt cake as in the furnace of the sodamaker, and these reactions in the pot seem to improve and aid the process of glass-making.—American Manufacturer.

Paper Manufacture.

The United States Consul-General at Seoul, in his last report, says that paper manufacture is one of the leading industries of Corea. This paper is highly esteemed, and always forms part of royal presents, and of the tribute paid to China. Besides its use for writing and for books, it is employed in a great diversity of ways. It serves as string and in the manufacture of lanterns, fans, umbrellas, shoe soles, hats, boxes, and coats. It is also used for covering floors, walls, and ceilings, and, stretched on frames, supplies windows and doors. It is highly prized in China and Japan, and is especially sought after for the manufacture of umbrellas. It is made from the bush of the mulberry order (*Broussonetia papyrifera*), which is indigenous, growing in many parts of the kingdom, but thriving best in the moist, warm climate of the south. It is chiefly grown from cuttings for this especial purpose, and the wild and cultivated plants are said to be of equal value. The bark, which alone is used, is generally gathered in the spring, and it is boiled for a long time in water, in which a quantity of wood ashes has been mixed, until it becomes a pulp, the mass having been beaten during the whole time of the boiling. Fine bamboo screens are then placed in shallow wooden vats, and a ladleful of the pulp is evenly spread over the screen by a dexterous circular motion of the hand. This operation is repeated once or twice, or as often as may be necessary—the more frequent the operation, the finer the paper—and the screen allowed to drain into the vats, until a proper consistency is reached, the drippings being thus saved. They are placed on a hot *kang* floor to dry. After the drying has proceeded far enough, the paper is laid on a hot floor, and ironed by hand. The long lines in the paper show strands of the bamboo screens, and their nearness, distinctness or absence indicate the fineness or otherwise of the paper. They are almost imperceptible in some grades of paper, while in others they are distinct and far apart. Paper is made by the Paper Guild, a numerous and prosperous association. The province of Chulla is the chief seat of manufacture.—Science.

OZOKERITE.—An important memoir on the petroleum and ozokerite of Galicia, by Mr. Boverton Redwood, appears in the *Jour. Soc. Chemical Industry* (Vol. XI, No. 2). Petroleum occurs in the "Carpathian sandstones," the upper member of which is Eocene, the lower being Neocomian; in the upper Eocene or Oligocene; and in the Miocene beds. Ozokerite is found in small quantities in the older strata, but the main deposits are in the Miocene of Boryslaw. This material is extracted by shafts; while the petroleum is pumped from bore-holes. The strata are much folded, and are sometimes slightly inverted. The more productive areas for petroleum are frequently along anticlinal folds. Mr. Redwood's memoir is rendered much more valuable by the addition of a general map of Europe, on which all the principal petroleum fields are marked.

Fuse Wire.

The fuse wire department of the Sperry Electric Mining Machine Company, Chicago, is discovering many interesting facts in testing its product. Any person familiar with the fuse wire market cannot have failed to notice the very material difference in the length of fuses recommended by different makers. For instance, 100-ampere links may be found on the market varying from one to eight inches in length, and there is a corresponding disparity in other sizes. Doubtless the shortest fuse which will act perfectly under all circumstances is the one to be recommended, but just what relation the length bears to the fusing point is a feature in fuses that the Sperry Company has been investigating. To show the actual variation in fusing point for different lengths the following examples are given: Wire rated as 5-ampere safe carrylng capacity in 1¾-inch length, fuses at 10 amperes, while in ½-inch length at 19 amperes, 10 amperes in 2¼ length fuses at 18 amperes, in ¾-inch length at 29½ amperes, 50 amperes in 3-inch length fuses at 72½, in 1-inch length at 110 amperes, 200 amperes in 4¾-inch length fuses at 224 amperes, in 1-inch length at 316 amperes. It will be seen from the above that in the small sizes a large percentage of allowance is made between safe carrying and fusing points, as the danger element is small and the unnecessary blowing of a fuse troublesome. As the capacity increases the percentage is lowered, until at 500 amepres but 10 per cent of allowance is made. It must be understood, however, that the results in case of the short fuses are dependent in a large measure on the terminals, and this element of uncertainty is inevitable whenever such fuses are used, since it is impossible for the manufacturer to anticipate what sized terminals will be used by the station superintendent.—Western Electrician.

THE DIAMETER OE FULGURITES.—When a bolt of lightning strikes a bed of sand, says an exchange, it plunges downward for a distance, less or greater, transforming simultaneously into glass the silica in the material through which it passes. Thus, by its great heat, it forms at once a glass tube of precisely its own size. Now and then such a tube is found and dug up. Fulgurites have been followed into the sand by excavations for nearly 30 feet. They vary in interior diameter from the size of a quill to three inches or more, according to the bore of the flash. But fulgurites are not alone produced in sand; they are found also in solid rocks, though very naturally of slight depth and frequently existing merely as a thin glassy coating on the surface. Such fulgurites occur in astonishing abundance on the summit of Little Ararat, in Armenia. The rock is soft, and so porous that blocks a foot long can be obtained, perforated in all directions by little tubes filled with bottle-green glass formed from the fused rock.

PLATE GLASS EXAMINATION.—The United States Consul at Antwerp, in a description of plate glass manufacture in Belgium, states that, after polishing, the plates are taken to the chamber for examination, a room hung entirely in black and which receives a ray of light from the east by an opening at the height of from 1.5 to 2 meters, according to the size of the plates to be examined. The plate is placed vertically upon a table covered in black, so as to receive a ray of light at an angle of 45°. By such an installation every imperfection, such as scratches, air bulbs, etc., which may exist is immediately discovered, while in full light they would not be seen. The plates especially designed for mirrors and to be silvered receive a second examination in a dark room, which receives the light only through an opening of 25 to 50 centimeters and at a height of about 2½ meters. The plate is on a black table and receives the light from the east at an angle of 45°, and is moved by hand so as to receive the light upon its entire surface.

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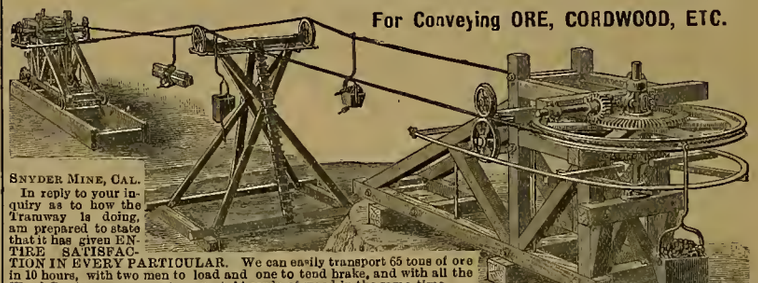

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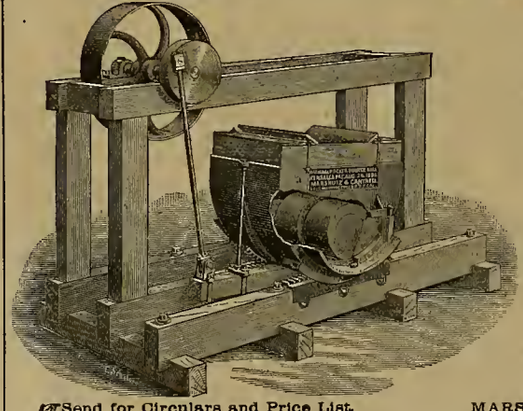

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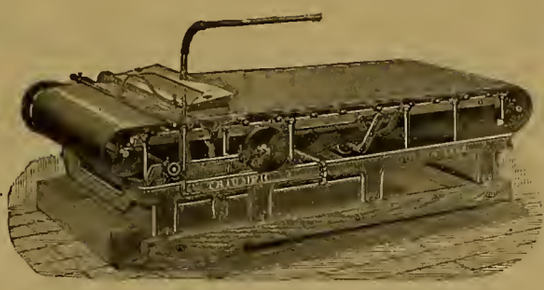

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Signed] Sup't North Star and Original Empire Mining Co.

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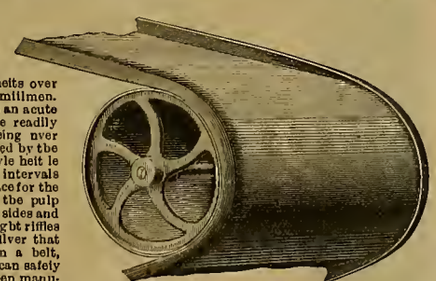

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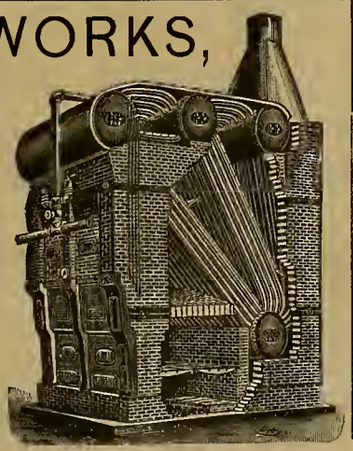

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ELECTRICITY.

The Frankfort-Lauffen Experiments.

It is now just ten years ago that Marcel Deprez demonstrated, in a practical way, the possibility of transmitting energy electrically with a degree of efficiency over long distances heretofore unattainable by other methods; and though the total amount of power received at Munich from Miesbach, 37 miles off, was barely half a horse power, the experiment served to show that the method, as a rule, was feasible. The last ten years have more than confirmed the estimate of the results then obtained, but it remained to show how far the progress made in the modern applications of high potentials could be applied to this same problem of long-distance transmission. There were not a few who shook their heads at the thought of using 30,000 volts on a line over 100 miles in length, and subject to many adverse conditions under which overhead lines labor. Again, the probable loss in the line itself, due to its electrostatic capacity, was a matter of conjecture by no means favorable to a successful issue. Again, while few doubted the possibility of constructing transformers capable of standing a pressure of 30,000 volts, the fact remained to be demonstrated. But the success of the experiments is confirmed by the official report of the testing committee, part of which is now given to the public. Taking a few representative figures among the tests, we find that with 78 h. p. applied to the dynamo by the turbine, 53.5 h. p. or 68.5 per cent was delivered by the second transformer at the distant end, 109 miles off; with 150 h. p. at Lauffen, an efficiency of 75.3 per cent was reached, and with 197.4 h. p., 73.9 per cent. These experiments were carried on in all sorts of weather, and though the potential employed is not given in the tables thus far published, it is safe to say that it was probably not below 15,000 volts. Considering the fact that the transmission included two transformations in converters, together with the loss in the dynamo and in the line, the result obtained is excellent proof of the high order of construction embodied in the apparatus employed and reflects credit on both parties to the undertaking—the Allgemeine Elektricitats-Gesellschaft, of Berlin, and the Oerlikon Maschinenfabrik, of Oerlikon, Switzerland. Electrical Engineer.

Electrical Rapid Transit.

There is something stupendous about the idea of constructing before May, 1893, an electrical express line 250 miles long between Chicago and St. Louis, and equipping it with all the necessary apparatus for the transportation of passengers. *Electric Power* says that the difficulties in the way are mainly electrical in their nature, as the construction of the roadbed is merely the question of employing men enough to do the work. The railroad engineers have already done their part of it by surveying an absolutely straight road from one city to the other. But the electric portion of the system will require, besides the absolute time employed in the manufacture of the electrical apparatus, a good deal of engineering work in order to determine the best forms and proportions. The author of the system, Dr. Wellington Adams, has no doubt, however, that the whole equipment will be ready in time for the opening of the World's Fair next year.

In a lecture delivered before the New York Electric Club, Dr. Adams gave the mechanical details with cooiderable fullness. Moreover, the general features of the electrical system were set forth as of the multiphase type, the generator being like the one that was used at the Frankfort-Lauffen power installation. It is to be regretted that the details of the motor were not added, but we presume they were withheld for good reasons.

In the course of the discussion which followed Dr. Adams' lecture, Professor George Forbes of London called attention for the first time, so far as we have observed, to the advantages of a perfectly straight line for electrical high-speed service on account of the freedom which it guarantees from the effects of the gyroscopic action of the wheels and motors. The effect of this action in tending to throw electric engines off the track while rounding curves is certainly worthy of being noted. Since it acts in the same direction as the centrifugal force Professor Forbes suggested as a means of counteracting the gyroscopic action that two motors, attached one above the other to the same solid framework, should be employed and both of them geared together revolving at the same rate. In that case the gyroscopic action of the two, so far as it relates to the framework itself, would be opposed. There are other ways of offsetting the effects of gyroscopic action, and now that attention has been called to it we shall have suggestions from other inventors.

Oil vs. Air as Insulation.

At the recent meeting of the American Institute of Electrical Engineers, Dr. James B. Williams of New York (formerly of San Francisco) read a very interesting paper on "Oil versus Air as Insulation," in which he reported a number of experiments going to upset entirely the idea as to the higher insulating qualities of oil—so far as they went. The paper was not presented in print, and its discussion was therefore adjourned until the fall, when Dr. Williams will repeat his experiments before the institute not only with air and oils but with a number of the leading insulations now known to commerce.

The facts set forth in this paper were obtained wholly from experiments and tests made by the doctor in New York City and by himself and his brother, R. W. Welty, in California while they were making the investigation of insulating material and its uses, which is now being described in a serial in this journal. These experiments and tests were made with special apparatus designed and made by Dr. Williams for testing insulating material by means of charges of high potential; and the results obtained are worthy of careful consideration on account of the perfection of this apparatus. The results show that, when used to insulate conductors carrying high-tension *constant* currents: 1. Air even with a humidity of 80 per cent is far superior to oil. 2. That air is superior to pure paraffine. 3. That steam will conduct such currents, but is superior to oil. 4. A film of oil on glass and porcelain will not prevent surface leakage. 5. Oil, if placed on paraffined hard rubber, at once ruins the surface insulation of that material. Other subjects treated of were: 1. The expansion of oil in pipes or tubes. 2. The use of fibrous material in combination with oil. 3. Absorption of moisture by oil.

Reference was also made to some new forms of insulated conductors invented and patented by the doctor, in which dry air in combination with other insulating material is used to form the dielectrics thereof.

ELECTRIC LOCOMOTIVES.—The 1200-h. p. electric locomotives, which the Thomson-Houston Co. is building to operate trains on the Baltimore Belt Line tunnel, will have four pairs of driving wheels and will weigh 80 tons. The *Electrical World* states that there will be a separate 300-h. p. motor for each axle, the armature being keyed directly to the axle. The current will be taken from a third rail of iron or from a large copper tube, by some form of sliding contact. The conductor will be thoroughly insulated, and will be supplied with feeders at frequent intervals. The potential used will be 500 volts. Two of the locomotives are expected to be in steady use, the third being held in reserve. The electricity will be generated at a central power station, where four compound Corliss engines of about 750-h. p. each will drive direct the coupled dynamos. The train movement in the tunnel will be about 400 trains daily. Besides hauliog this, it is intended to employ the electric locomotives as pushers for heavy freight trains on a 1½ per cent grade, just beyond the tunnel. The results of the experiment will be watched with great interest. The load on the central station of an ordinary electric railway is variable enough; but the variations in this case will be such as in a common installation is sufficient to cause a wreck. The governing arrangements will need to be remarkably perfect to cope with the sudden throwing on or off of a load of 2400-h. p., or the total load on the central station.—Engineering News.

ELECTRIC SAND. — "Electric sand" is the name of a new substance for which some extraordinary claims are made. Word has been received from the Wright Universal Electric Company of New York, by the *Western Electrician*, that after many years of investigation and experiment, it is now enabled to present to the trade a new product. "Electric sand" is described as a simple compound resembling sand, but which is as solnble in water as sugar. When the Wright battery is charged with the sand and water, the generation of the current is instantaneous. It is stated by the company that the chemical action on the zinc and carbon plates is not attended with the formation of crystals, thus obviating the cessation of action of the battery by reason of insulation due to crystallization. The current generated by electric sand, this company claims, is absolutely and perfectly harmless in any of its appliances.

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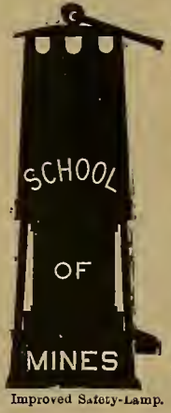

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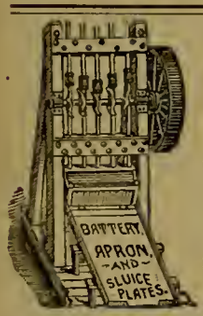

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USEFUL INFORMATION.

LIMITS OF TREE-VEGETATION. — The latest researches of the Finnish expedition to the Kola peninsula will modify, as we learn from *Nature*, the position of the line which now represents on our maps the northern limits of tree-vegetation in that part of Northern Europe. The northern limit of coniferous forests follows a sinuous line which crosses the peninsula from the northwest to the southeast. But it now appears that birch penetrates much farther north than the coniferous trees, and that birch forests or groves may be considered as constituting a separate outer zone which fringes the former. The northern limits of birch groves are represented by a very broken line, as they penetrate most of the valleys almost down to the seashore; so that the tundras not only occupy but a narrow space along the seacoast, but they are also broken by the extensions of birch forests down the valleys. As to the tundras which have been shown of late in the interior of the peninsula, and have been marked on Drude's map in Berghaus' atlas, the Finnish explorers remark that the treeless spaces on the Ponoi are not tundras but extensive marshes, the vegetation of which belongs to the forest region. The Arctic or tundra vegetation is thus limited to a narrow and irregular zone along the coast, and to a few elevated points in the interior of the peninsula, like the Khibin tundras, or the Luyavrurt (1120 metres high). The conifer forests, whose northern limit offers much fewer sinuosities than the northern limit of birch-growths, consist of fir and Scotch fir; sometimes the former and sometimes the latter extending up to the northern border of the coniferous zone.

WHY COAL COKES.—By some German chemists tests have been made to ascertain the physical cause of the coking or fusing of bituminous coal into the form of coke, under distilling heat, the conclusion being that such a phenomenon is connected with the chemical composition of the coal, with especial relation to the richness of the coal in what is called disposable hydrogen, or that proportion of it which is in excess of the quantity required to form water with the oxygen present. It has recently been asserted, however, that such a standard for the coking quality in coal does not correspond with observed results, nor does the richness of a sample of coke in carbon determine its coking capabilities, the fact being that two specimens of coal of practically identical carbon composition will often be found to behave very differently in the retort of coke ovens. It is argued, therefore, that if the property of coking does not reside either in the surplus hydrogen or the fixed carbon, it is certainly not to be found in the content of the coal in oxygen, which gives no indication whatever of the physical behavior of the coal under heat. Some coking coals coke without much swelling, while others swell to a considerable extent during the process. In either case the coal must undergo a state of fusion, in which it becomes a think, semifluid mass, through which the gas escapes.

REFINING COPPER.—The air of mystery that has for a long time surrounded the processes for the electrolytic refining of coppers is, we are glad to note, being removed, and in a manner which leaves no room for doubt that in the near future this industry will occupy a leading position in the electric arts. Prof. Badt points out in his Institute paper that the principles are well established, and with proper attention to details success in this field is assured. With the immense mineral resources of the United States, which have already made it the largest copper-producing country in the world, it is not difficult to foresee the time when we shall supply foreign markets with electrolytically refined copper. That this can be done profitably is evidenced by recent shipments of such copper abroad, so that the producer is not entirely dependent upon home markets.—Electrical Engineer.

CARE OF THE FURNACE.—A suggestion to housekeepers who use furnaces is to have the tin heating pipes disconnected in the spring, thoroughly cleaned and stood upright in the cellar until fall. The soot and dust which accumulates in these pipes will, if left, rot away the inner lining and cause them to wear out much quicker than if properly cared for. The furnace should be carefully cleaned out and the tools used about it, poker, shovel, ash scraper, etc., looked up and put inside. If they are lying about the cellar they run the risk of being buried under the coal, usually put in during the summer, besides offering too great temptations to the boy of the house.

METALLURGY.

Qualitative Detection of Nickel and Cobalt.

The qualitative detection of nickel in presence of cobalt is often a difficulty with the beginner in the study of analysis. When the conditions are correctly understood, Liebig's cyanide separation—the essential details of which were fully worked out by Gauhe (*Zeit. fur Anal. Chem.*, 1866, p. 75) in 1866—is, in the writer's experience, the simplest and most rapidly executed. Although clearly stated by Fresenius in his "*Quantitative Analysis*," so far as I am aware there is not one of all the multitude of text-books on qualitative analysis in our language which recommends this method that does not introduce some unnecessary condition into the procedure, and in most cases the student's difficulties arise not from his own incapacity, but from the faulty description given by his text-book.

Although the subject is not original, it may therefore be useful to call attention to the simplest and most satisfactory method of working. Gauhe showed conclusively that the conversion of potassium cobaltous cyanide into the cobalticyanide by boiling with hydrocyanic acid (at best a dangerous experiment), is always incomplete; but that by means of a suitable oxidizing agent, in alkaline solution, the cobalt may be directly converted into the soluble cobalticyanide, the nickel being simultaneously precipitated as hydrated nickelic oxide. The method of detecting nickel in presence of cobalt is then as follows: Separate the mixed sulphides from the ammonium sulphide precipitate by means of cold dilute hydrochloric acid, and test a small portion in a borax bead. The presence or absence of anything more than a trace of cobalt is directly indicated by the coloration produced. Dissolve the sulphides in hot hydrochloric acid with the aid of potassium chlorate, boil off the excess of chlorine, and remove the excess of acid either by neutralization or evaporation to dryness. To the neutral solution add an excess of freshly prepared solution of potassium cyanide in cold water, beyond what is necessary to redissolve the precipitated cyanides. Boiling is unnecessary. Make the solution decidedly alkaline with sodium hydrate, add about twice the volume of bromine water, heat gently, allow to stand a few minutes, and filter off the precipitated nickelic oxide. The nickel may be confirmed by the borax-bead reaction after washing the precipitate.

The action of the oxidizing agent can be represented by equations, thus:

$$2KCN.Co(CN)_2 + 2KCN + Br = K_3Co(CN)_6 + KBr.$$

$$2KCN.Ni(CN_2 + 3NaOH + Br = Ni(OH)_3 + NaBr + 2KCN + 2NaCN.$$

There is no liberation of hydrocyanic acid at any stage of the process, so the operations may be safely conducted in the open laboratory. Commercial cobalt salts almost invariably give a precipitate of nickelic oxide. The cyanide method has the advantage over the precipitation of the cobalt as potassium cobaltinitrite, in that the separation is most frequently carried out with the object of detecting nickel, which metal is immediately separated as a precipitate readily available for examination.

If the analysis is to include a search for traces of cobalt, the alkaline filtrate from the nickel precipitate is, in the draught cupboard, acidified with excess of sulphuric acid, and evaporated until the excess of acid is nearly expelled. The residue is taken up with water, made alkaline with ammonium, the cobalt, if present, precipitated by ammonium sulphide, and confirmed by the borax bead. Or, a portion of the neutral solution containing the nickel may be treated with acetic acid and potassium nitrite, and the traces of cobalt directly precipitated by allowing to stand for a few hours.—Fred J. Hambly in Chemical News.

MANGANIFEROUS ORES FROM CARTHAGENA.—The exportation of dry iron ores and manganiferous ores from Carthagena, Spain, during 1891 was very small as compared with 1890, the total quantity exported amounting to 421,200 tons. This is a decrease of 402,900 tons as compared with 1890. A considerable portion of the iron ore mines were at intervals stopped from working for several months, from want of ore purchasers and from lack of space at the wharfs and depot, which were all overstocked, thus throwing numerous laborers out of work and causing the price of ore to come down. On the other hand, iron mining all through the district, it may be said, is steadily on the increase, some new mines having been opened during the year. The price of iron ore free on board steamer at Carthagena ranged during the last year from $1.30 to $1.70 per ton of 2240 pounds for 50 per cent of metallic iron contained in the ore, with a sliding scale of from 6 to 8 cents per unit in excess of that percentage. Manganiferous iron ore was sold, according to class and conditions of sale, at from $2 to $4 per ton, free on board at Carthagena. It was shipped as follows: To England, 198,273 tons; to the United States, 165,227 tons; to Holland, 40,400 tons; to France, 17,300 tons. The ore shipped to the United States may be classified as follows: Dry iron ore, 113,386 tons; manganiferous iron ore, 51,841 tons, with a full value, free on board, of $320,096.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

WORK SUSPENDED.—*Record*, July 21: W. G. Wharf, superintendent of the Goodwin mine, came down from the mine last week. He says it is impossible to tell when operations can be resumed. The sister at the East in whose favor Goodwin's will was made, has brought suit to set aside the bond which the present partie secured upon the property. Until the matter is settled in the courts no further work is likely to be done.

THE BELMONT MINE.—At the Belmont, the work of sinking the Boss shaft is proceeding under favorable headway. At the present depth of 180 feet, the bottom of the shaft (which is east of the main ore body) is in formation of a very encouraging nature.

MEN PUT TO WORK.—Six men were put to work yesterday at the Coyote gravel mine above Oleta. Two miners were sent up from this place.

CAREONDALE'S PROSPECTS.—Sacramento *News*, July 21: There is now good reason to believe that some of the plans for establishing a fire-brick and pottery manufactory at Carbondale will be carried out as projected, since the property has fallen into the hands of an English syndicate with plenty of capitel. It has been shown that all the necessary material is on the ground, and that all that is needed is the wealth with which to develop the natural resources of the place to make it one of the busiest places in the vicinity.

SUTTER CREEK.—Cor. Amador *Ledger*, July 23: Mining is moving along in its usual encouraging way. Getting the water out of the Hector is going on very satisfactorily. Mr. Taylor, the foreman, states that they are now nearing the 700 level, where they intend to call a temporary halt for the purpose of opening up two or three levels between the 200 and 600 foot levels, where they feel confident there is an abundance of good pay ore. By the 1st September they expect to have the mill once more in motion, which is expected to put an end to drawing on the treesury. Efforts will then be directed toward getting to the bottom and reaching out for a permanent paying mine. At the Belmont, good progress is being made with the sinking of the Boss shaft, and Mr. Tibbits, the superintendent, reports the formation in the bottom of the shaft of a very encouraging nature, and we hope soon to be able to report better news from that level. The work of crosscutting both east and west in the South Eureka is still progressing, with nothing new to report.

Butte.

MINING AT BANGOR.—Oroville *Register*, July 20: W. W. Will of the Bishop mine told us on Saturday last that mining would begin this week. Fifteen men would be put on the day shift at present, but in a short time this force would be doubled and a night shift would be put to work. Hay & Clark are putting up a 20-stamp mill and will be ready to begin crushing cement in about three weeks. At the Bisbop mine a rock breaker is used and then the gravel run through arrastres. It is thought 40 tons each 24 hours can be worked. Everything promises well in the various blue lead mines about Bangor, and the new companies that have been organized are pushing work lively.

Calaveras.

OUR MINING INTERESTS.—Calaveras *Citizen*, July 23: Almost daily flattering reports are received of the striking of new mines in and around this vicinity. The mines about El Dorado and Jesus Maria are looking up and at present considerable capital is being invested. The old McPherson mine, situated near El Dorado, is being put in working order and woodchopping for this mine has already begun. This is, without a doubt, a valuable piece of property. There are a great many fine lodes laying idle around us, merely for the want of capital to develop them. Should our mines be thoroughly opened once, we are satisfied they would be permanent and make lively places of our little towns. Gold tells, and wherever that article is found in paying quantities, money is plentiful, wages good and the people prosperous and happy. More encouragement should be given our prospectors and help the good cause along.

THE SHENANDOAH.—Considerable activity is being manifested at present in mining operations in the vicinity of Jesus Maria. At the "Shenandoah" or "Hoosier" mine we are informed that some flattering developments have been made lately, and that owing to the "pile" secured at a recent wash-up, the company has concluded to add 10 more stamps to the plant which they now have in operation, making a total of 20. Quite a force of new hands is being put on and we understand a number of the young miners of this city have secured positions there already.

MAYFLOWER.—Calaveras *Citizen*, July 23: The report is current upon our streets that the Mayflower mine, situated about a mile northwest of Sheep Ranch, has been sold recently to San Francisco parties. The price paid and the names of the purchasers have not been learned, although it is said Mr. Chas. Ross has been instrumental in the consummation of the sale. If this is true, the mining outlook here is again assuming favorable condition. The Mayflower mine has already been considerably developed and a large body of ore is now upon the dumps and, it is said, assays splendidly. There is no mill upon this mine and rumor says that the new company has received a backset in procuring a suitable mill site. It is to be hoped no one will be so obstinate as to throw a single obstacle in the way of encouragement to any mining enterprise here. The welfare of our town depends much upon more resources, and the sooner they are found and fostered the sooner will our prosperity increase. There is quite a revival in quartz mining at Sheep Ranch. Several mines have recently been bonded and it looks as though this section was occupying the attention of capitalists. Many a dollar in gold has been taken from the various mines around here, and it is evident that they are worthy of still further investigation.

Humboldt.

WHITE ROCK.—Cor. Blue Lake *Advocate*, July 23: Most every one in camp is busy. While the mines here may not pay very large dividends, yet they will compare favorably with any of the camps in this portion of the State, the amount of capital invested considered. Miller & Stone of the Sherwood mine have just completed a run of 75 tons of ore which we understand was satisfactory. Nicholson & Lees of the same mine have on their dump about 60 tons of ore, to which they are adding every day. It is a fine quality of rock, and will probably bring them in good returns. Fulmore & Miller (same mine) are not taking out any ore at present, but are drifting for air. The Sherwood is having the lower tunnel driven into the mountain as speedily as possible. It is in now over 200 feet. This tunnel will open the mine on a lower level than any yet run in on the ledge. They expect to have to go to quite a distance yet before pay ore is struck. Miller & Stone are driving their tunnel ahead in the expectation of striking a new chute beyond the break. D. M. Stoody is taking ore from the Brizard mine which the writer is informed is fairly good. James A. Gulick is working the Uncle Sam mine. Manuel Brown is doing the assessment work on the Grover Cleveland. G. W. Healy is working on the Mohawk mine. Messrs. Brooke & Tinsley are pushing work on the Mary Blaine. Clements & Ladd of the Mountain Boomer are still sluicing the old dumps, which we are led to believe are paying very well. Owing to the scarcity of water, they will shut down in a few days, but will commence operations underground. Some work is being done on the Tough Nut mine. Mr. Colgrove informs me that he will start the Excelsior on Monday. He has just finished a run of about 50 tons of rock through the mill. There is some talk of the Ridgeway starting up in the dim future, but no stated time is set. The Hardtack and the Hunter are idle. Mr. Mills, we believe, will begin the assessment work on the New York Helen in a short time. G. C. Sarvis of Eureka is working his mine at present. The placer miners on Pony creek are still working, but as water is getting short they will likely prepare for the coming winter. Mr. Yocum has just returned from a visit to Willow creek. He reports that the mine owners there expect to sell their property in the near future.

Kern.

RICH GOLD QUARTZ.—*Californian*, July 21: The Hitchcock brothers, who successfully mined on the Greenborn for some years, recently made an arrangement with A. J. Maltby near White river, by which they agreed to reopen one of his mines worked years ago, for a half interest in the property. There is now a working shaft 100 feet deep and a tunnel 150 long, and a fine ledge of ore has been uncovered. The last crushing of 38 tons, just made at the Tailbolt stamp mill, yielded $2600 in gold, and there is more in sight equally good.

OIL AND ASPHALT NOTES.—An oil tank car, the first of a number to be used by the Jewett & Blodget Oil Co. for transporting petroleum in bulk, has just been received. Two cars of maltha have been shipped this week, and two cars of asphalt for Eastern cities are now loading. The works at Sunset are taxed to their utmost capacity turning out asphalt to fill orders which its proven excellence has brought. Fresno now uses petroleum as fuel in its water, gas and electric light works, and two other power establishments are considering the desirability of its use. Fresno also manufactures gas for lighting from petroleum exclusively by the Lowe process, the same as used in Pasadena, and is discarding all coal in its works for any purpose. The retaining walls of the bridge over the Kespe river near Filmore are built of bowlders, with Kern county asphalt as mortar or cement. The Southern Pacific Company is alive to the advantages of California asphalt in railroad work, and is constantly experimenting in its uses.

Nevada.

THE LAFAYETTE MINE.—Grass Valley *Telegraph*, July 19: The report in the *Telegraph* of yesterday concerning the cleanup from the results of the crushing of the six loads of ore from the Lafayette mine was erronious. There were just six loads crushed, and they were crushed at the Rodgers mill in Boston ravine. The yield was $151.50 per load, not counting the "beadings." The mine is looking well throughout, and there is plenty more of such paying ore right now in sight.

DAISY HILL MINE.—Grass Valley *Tidings*, July 20: The Daisy Hill mine has been bonded from Frank Morse by George Mainhart and others, and a company has been organized in San Francisco to develop the property. The company is now about to commence operations, we understand. Geo. H. Gamble, a well-known San Francisco mining man is here on business connected with the enterprise.

SAUVEE MINE.—Negotiations looking to the development of the Sauvee mine, adjoining the W. Y. O. D., have been in progress for some time. To-day an agreement was entered into by which the property will be exploited by Eastern capital. Work will be commenced within a fortnight, it is understood.

MORE SPECIMENS.—The prediction made by the *Tidings* last week that the Peabody mine would undoubtedly yield a rich lot of specimens in a few days, was verified to-day, when a big boxful of rich ore was brought to town. The box is two feet long by a foot in width and depth, and the ore will yield, it is estimated, $10 per pound, or perhaps a dollar an ounce. The specimens came from the stope between the 300-foot and 400 foot levels, at a point where the rich shoot was expected to be found, judging from developments above.

IMPORTANT STRIKE.—Grass Valley *Tidings*, July 20: A strike that promises to add another dividend-paying mine to Grass Valley's credit has been made in the Central North Star property, owned by the Weissbein Bros., Capt. James Bennallack and San Francisco parties. At a depth of 230 feet, a ledge formation three feet in width has been cut, of which there are 14 inches of solid ribbon quartz, the remainder broken up and mixed, but giving every indication of uniting further on. The strike was made in a drift. The quartz shows free gold, carries a good quality of sulphurets, also galena and iron, and in every respect looks like a profitable milling proposition. The country rock is all that could be desired and is heavily mineralized. The Central North Star adjoins the celebrated North Star on the east, and the property is virgin ground. Many miners have not believed that this ground carried a payshoot, but Mr. Bennallack, who was superintendent of the North Star in the early days, and is now superintendent of the Central North Star, has always had a good opinion of it, an opinion now verified, for he has certainly discovered a pay-shoot, and, with his coowners, is a subject for congratulation. Incidentally, the North Star Company will no doubt benefit largely by the discovery, as the newly found pay-shoot undoubtedly exists in that company's ground also. Of course, no time will be lost now in demonstrating this.

Plumas.

A RICH MINE.—Oroville *Mercury*, July 20: The Thistle Shaft mine, situated on the divide between La Porte and Gibsonville, shipped about $10,000 after a two week's run. Underground they are not working a very large force, and the above fact is good evidence of the wonderful richness of the mine. They have a large territory to work, and have demonstrated that they possess one of the richest mines in the State.

San Bernardino.

IDEX.—San Bernardino *Gazette*, July 20: Knowing that Jack Anderson, Pete Klinefelter, George Frost, E. B. Stanton of Riverside and C. M. Marriner of Los Angeles, all owners of the celebrated Ibex mine, situated near the Needles, in this county, had returned from a tour of inspection of the mine yesterday, a reporter called on Mr. Anderson and gleaned the following: There have been 18 men at work on the mine since the present company purchased it on the 15th of December last, and during this time they have built a large boarding house, office and blacksmith shop, and have been steadily developing the mine. They have also built a good road from the mine to the Atlantic & Pacific railroad, which is three and a half miles distant. For the past 30 days they have been shipping their ore from all parts of the mine to the Victor mill, and it has averaged $41.80 per ton. This run was made as a test, and it is perfectly satisfactory to the owners. Mr. Anderson says that there is a mountain of good ore in sight. They left 12 men at work at the mine, who will thoroughly develop the property from now until next November, when the company intend to erect a 20, and probably a 60-stamp mill on the line of the railroad and about three miles from the mine.

Shasta.

NOTES.—Shasta *Courier*, July 20: The ten stamps on the Mammoth are running constantly on good ore. J. N. Vaunoy shipped his carload of iron ore from Stillwater last Friday. We hear that a large body of $50 ore was recently opened in the Calumet. More good lead prospects are reported from the Round Mountain country. Geo. McDaniels found a good prospect since he went up there. Dr. F. P. Mitchell and Mr. Wm. Andrews, of Whiskytown, left last week on a prospecting trip through the northeastern part of Trinity county. Last week Jack Strode sold his mine, situated near Whiskytown, to a company of Colorado men, who made the first payment on the mine last Friday. S. Weil, from Squaw creek, says the Riley & Bliss mine is opening out fine. Their ten-stamp mill is running on high-grade ore from a new body of ore he and Conroy found since they took hold of the mine. John Lowden, of the Golden Eagle Hotel, sent a sample of lead ore to the Stege Smelting Works recently, and it proved to be fine ore. It runs 37 per cent lead, carries 30 ounces of silver, and contains no antimony. It also contains 27 per cent of zinc. The discoverers say there is a six-foot vein where the sample was taken. It is located near Round Mountain, but the exact location is kept secret.

RICH STRIKE.—Redding *Free Press*, July 25: Vandeveer & Bullard, who for two years or more have been operating on Flat creek, and who have taken out considerable money, have struck it richer than ever. About 300 feet from the surface, in their tunnel 400 feet long, they blasted out this week a carload of the richest kind of quartz, filled with seams in which large quantities of gold were deposited. One lump of quartz as large as a man's head was a sight seldom seen, glittering gold all over it. The depth from which this rock was taken indicates a mine. The owners have been operating an arrastre, by which process they have lost considerable gold, and they are now considering the advisability of shipping the ore. The gold is very fine and full of air cells, causing much of it to float away on the water. S. Weil, of Squaw Creek, says the mine is looking first-class. From another source we learn that the present owners have been offered $60,000 for their bargain. We learn that Harrison, Lyons & Meeks have made a conditional sale of the Quartz Hill mine for $36,000, a payment of $3000 to be made in six weeks, the balance in stated payments of different amounts. The purchasers are San Francisco parties, who expect to be able to work the ore at a cost of 20 cents per ton. There is a whole mountain or blow-out of quartz, the poorest of which will assay from $4 to $6 per ton.

SOUTH FORK.—Cor. Anderson Valley *News*, July 25: The Crystal mine, on Andrews creek, is running full blast under the supervision of Robert Thistlewaite, of S. F. The company has put in a gasoline engine for hoisting purposes. The water has been raised from the shaft, and they will commence to sink deeper as they finish timbering, which will be in a day or two. The Martin boys have the Black Prince mine leased, and are running two shifts. They have a good prospect of taking out lots of good ore. W. D. Bull has commenced work on his mine. He has put in a horse power hoist for raising water and rock. His mine looks well. J. P. Wright is taking out good ore. He has several miners employed. W. O. Cooper and Henry Davidson are taking out good ore from the South Extension of the Dayton. They shipped some ore lately that gave very satisfactory returns. E. L. Ballou is taking out ore to ship. He sorts out the richer and will work the lower grade in his arrastre. The Shirland Bros. are hard at work on their mine, taking out some good ore. The reduction works are still at a standstill, and it looks at present as if it would not start for some time.

Tulare.

A MOUNTAIN OF COPPER.—Visalia *Times*, July 21: M. P. Lesher came down from the headwaters of the Kaweah, Monday. A *Times* reporter met him Tuesday evening and heard his story of the rich copper mine the gentleman says he has found some 62 miles east of Visalia, and 12 miles due north of Mineral King. Mr. Lesher located the mine last year, and has his claim properly recorded. He calls it the North Star copper mine. He has had several men helping him dig the tunnel this summer. The size of the vein of lead matter is 18 by 15 feet and the vein evidently extends through the whole of the large mountain in which it is located. Mr. Lesher, who claims to know something about copper mines, says that it is the richest mine of pure copper he ever saw. While digging on the tunnel this summer, he made a curious discovery. In chiseling on one of the walls of the tunnel, he thought for some time that the sounds that followed the blows seemed to indicate a hollow close at hand. Striking the drill a hard blow one time, it went through into an open space. When an opening large enough was made, it disclosed a large cave 30 by 15 feet and about 16 feet high. Mr. Lesher says the mine is on the headwaters of the Kaweah, and he has seen large snowbanks there in September. Near at hand are several lakes, and one of these has a great depth to it.

Siskiyou.

"STRUCK ILE."—*Telegram*, July 26: Clarence Prather, who has been for some time past engaged in sinking an artesian well at his farm near Montagne, can well be said to have "struck ile," as a superior quality of petroleum flows out with the water. It is supposed that at a lower depth, and by the use of special machinery, the oil and water can be separated. The new machinery has already been ordered, and will arrive in a short time, when the well will be sunk several hundred feet deeper than at present. It is one of the finest oil prospects that has yet been found on the coast, and Mr. Prather has received a flattering offer for its purchase from the Standard Oil Co., but he prefers to retain the property and work it himself. The well is now down about 500 feet.

Trinity.

NEW RIVER.—Cor. Trinity *Journal*, July 23: The mines are doing well. Leas & Nicholson have out a good lot of rich ore from the Sherwood mine; but as water has failed, so Miller's mill has been shut down. It is their intention when they get about 100 tons, to have it packed to the Ridgeway mill to be crushed. Ladd & Clements have been washing the dump on the Boomer mine, and in so doing have uncovered a good ledge. I learn that they took out yesterday two tons that will go $60 to the ton.

NEVADA.

Washoe District.

CON. CAL. AND VA. MINE.—Virginia *Chronicle*, July 23: 1500 level—From the south drift at point of connection with the old stopes we continue to extract some ore and fillings of average milling value. From the upraise which was carried up from the end of the crosscut run west 36 feet in from the main south drift, 155 feet south from the shaft station, we have continued to work upward and to extract ore of fair quality. 1600 level—We have continued prospecting upward from the old sill floor of the old stopes, from which some ore of fair quality is being extracted. 1650 level—Continued to extract some ore from the drift run east from the winze No. 3 (down 73 feet) in working upward from that point. Also some ore from the old stopes at the north end of the California ground. In working upward from the drift run north from the bottom of the winze sunk 28 feet in this last locality through the old timbers, have continued to extract a few tons of milling ore. There have been extracted from all parts of the mine during the week 1001 1100-2000 tons of ore which was shipped to the Morgan mill, the average value of which, per car samples, was $29.30 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $25.22 per ton, per battery samples. Bullion shipped to Carson Mint, assay value $14,343.53. Bullion on hand in our assay office, assay value about $15,200.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, at a point 84 feet in from its mouth, the west crosscut has been advanced 20 feet; total length 46 feet, continuing in quartz formation which carries assay values varying from $6 to $12 per ton.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, at a point 40 feet east from the winze, has been advanced 18 feet; total length 171 feet; in porphyry and clay.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 27 feet; total length west from the joint shaft 2227 feet; the face is in porphyry and small streaks of quartz of low assay value.

UTAH.—340 level—From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, a west crosscut has been started and advanced 45 feet in a porphyry and clay formation.

SIERRA NEVADA.—The east crosscut No. 1 from the north drift, 100 feet in, Kenosha tunnel, has been advenced 33 feet, making its total distance 175 feet; face in soft porphyry. The joint Sierra Nevada and Union west drift, 900 level, was extended 27 feet, making a total distance west of shaft of 2227 feet; face in porphyry and small seams of quartz yielding low assays.

ANNES.—North drift from east crosscut No. 4, 420 level, was advanced 6 feet and the work in the face stopped for the present; total length of the drift 456 feet. From the end of this drift an east crosscut has been advanced 10 feet; formation quartz and clay.

GOULD & CURRY.—200 level—Northwest drift, started 435 feet west of shaft, has been extended 12 feet through hard porphyry; total length 424 feet. Also did some repairing on the 400 level during the past week. On the Sutro tunnel level we have resumed work in the joint north drift with the Savage Company, and have cleaned and repaired the same a distance of 50 feet. We are timbering the last 15 feet of the joint upraise where it connects with the joint winze from the Savage 1500 level.

BEST & BELCHER.—900 level—Have done some repairing to west crosscut No. 1 and advanced same a distance of 9 feet through hard porphyry; total length 395 feet. Also did considerable repairing to the north drift, 1000 level.

HALE & NORCROSS.—Have been retimbering the three compartments of the main shaft between the 400 and 500 levels. Main incline—Are making some necessary repairs to main incline, and are now putting in new guides between the 1700 and 1800 levels. 1800 level—During the week have completed the working station and chute on this level, and started a north drift and a south drift from the station.

CHOLLAR.—Are repairing north drifts on the 650 and 750 levels. The east crosscut near the north line, 900 level, is in 78 feet; face in soft porphyry.

POTOSI—Are running a drift from upraise, 1100 level, at a point 48 feet below 1100 level to connect with the Potosi winze. The north drift from bottom of south winze, 1200 level, is out 55 feet; face shows 4 feet of fair-grade quartz. Have connected the upraise from the 1300 level with north winze from 1200 level. Are timbering ground at connection. The joint northwest drift from the 1800 station, Ward shaft, has a total length of 637 feet; face in hard porphyry. Extracted and sent to the mill in the past week 509 300-2000 tons of ore from the 930, 1000, 1100, 1150 and 1200 levels. Milled during the week 509 tons. On hand at mill 107, 1600-2000 tons; average battery assay $25.08; average car sample assays $29.77. Shipped to Carson Mint 365 pounds of crude bullion.

BULLION.—The east crosscut, 560 feet south of north line, 1500 level, is out 60 feet; face in hard porphyry. The joint northwest drift from the 1800 station, Ward shaft, is advanced a total length of 638 feet; face in hard porphyry.

ALPHA.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 287 feet; face in clay and porphyry.

EXCHEQUER.—The joint Exchequer and Alpha south drift from north line of the Exchequer, 1800 level of Ward shaft, has a total length of 257 feet; face in clay and porphyry.

WARD COMBINATION SHAFT.—The joint Alpha and Exchequer south line drift from the north line of Exchequer, 1800 level of Ward shaft, has a total length of 287 feet; face in clay and porphyry. The joint Bullion and Potosi northwest drift, from the 1800 level, has a total length of 630 feet; face in hard porphyry.

CON. NEW YORK.—The winze in No. 4 west crosscut, 650 level, is down on the slope 4 feet; the bottom shows half a foot of fair-grade ore. The west crosscut, 850 level, is in 43 feet; face in low-grade quartz.

Ely District.

THE CYANIDE PROCESS AT WOAK.—White Pine *News*, July 20: The Ely Mill and Mining Co. have just completed a cyanide works at their mill here. They have put in four tanks of 30-ton capacity each. A tramway with a car attached is rigged up with water power to carry the tailings from the dumps to the tanks. High up above these tanks is the cyanide tank, which is connected with the other tanks by a pipe. This is so arranged that it can be used on the battery pulp when working ore as well as on tailings. The plant is a very simple piece of mechanism, and if it proves equal on a large scale to what it has done on small tests, the Ely M. & M. Co. have a good thing on their tailing pile alone. They have constructed a neat and substantial structure over the plant, and a week or so will satisfactorily determine whether the process is all that is claimed for it. To James McOmie, a member of the company, the *News* man is indebted for the courtesy of showing him through the works and explaining its mode of operation.

Tuscarora District.

NAVAJO.—*Times-Review*, July 23: The slopes above the 350-foot level continue about the same as last report.

BELLE ISLE.—North drift, 250-foot level, extended 7 feet. South drift, same level, extended to a fault. An upraise has been started on the ore in the drift. West intermediate crosscut above the 350-foot level extended 11 feet, cutting seams of low-grade ore.

NORTH BELLE ISLE.—No. 2 upraise, south of 500-foot level, extended 12 feet, showing a little ore coming in the top. An intermediate crosscut from this raise has been extended eight feet into the footwall. The stopes are yielding better.

COMMONWEALTH.—Second level: South drift from No. 5 chute advanced 13 feet. Have 40 feet more to connect with west drift of Nevada Queen. Have started raise on third level, 60 feet north of the line.

NEVADA QUEEN.—There have been worked at the Union mill 72.2 tons of first-class, pulp assay $262 per ton, and 598 cars second-class ore sent to concentrating plant—266.7 tons were concentrated; assay from battery, $24.62 per ton. Received from Union Mill Company $35,000 on account of sale of ore and concentrates.

ARIZONA.

WHITE HILLS.—*Examiner*, July 25: Mr. Schaefer, the discoverer of this new Arizona camp, in an interview, says: "The first location I reserved for myself, and my partner, Jno. P. Bernett, and some members of my family are coowners in the principal mines. There have been many other locations made since, and some of them are turning out well. The Schaefer Treasure is the first location made by me, and on the top of the ridge, four distinct veins—the Othello, Grand Army, Desdemona and another—are included in one location. South of these lie the Garfield, African, Occident, Horn Silver, Orient and the Norma. On the north are the Mayflower, Huldah and the Chief of the Hills. The latter, the easterly half of the location, 750x600 feet, I have just sold to parties from Virginia City, Nev., for $18,000. In speaking of the ores, which are free-milling chloride, the assays run high. I sent a piece of the first rock taken from the Norma, about 20 feet from the surface, to the *Examiner*. Some of the dirt which fell off of it was assayed at the Kingman Sampling Works, and it ran $744.20 in silver. The piece itself is here to be tested, and it will go in the neighborhood of $1324 in silver to the ton. The only assays which I will refer to just now have been made in this city at the instance of local experts. They will be safer to quote than any coming directly from myself. They run as follows, according to the certificates sent to me since my arrival: Grand Army—Gold, $41.34; silver, $118.94; total, $160.28. Garfield—Gold, $24.70; silver, $320.37; average of vein, $345.07. Norma—Gold, $6.20; silver, $2500.10; average of vein, $2506.20. Horn Silver—Lowest assay, $59.07 in silver; $6 20 in gold; average, $65.27. The lowest average so far obtained at the Kingman Sampling Works was 333 ounces in silver and 1¾ ounces in gold. We have sunk on several of the claims to a depth of from 10 to 30 feet, and find the veins holding out well with depth. Of course this is the main point, and development alone will prove the continuity of the deposit. There is no timber at the mines, but a plentiful supply of soft wood, cedar and pine, can be obtained within 18 miles. Water is scarce at the camp, of course, but we have got some at a depth of two feet, and expect to get a good supply from a well now down a distance of nine feet. On the dividing range, between Hualapai and Sacramento valleys, there are some good springs, and the elevation of 800 feet above the mines will give a good fall at the camp. On the east side of this range there are six or seven wells already sunk. A Los Angeles company is now figuring on boring a well right below my house at the camp."

MONTANA.

GOLD.—Phillipsburg *Mail*, July 23: If the reports of gold discoveries made in the section of country surrounding Phillipsburg, during the past week or so, prove to be half as good as many claim them to be, and their owners show up ledges to any reasonable extent, the greatest silver-producing district in the United States will soon earn the reputation of being a wonderful gold producer. Four rich gold discoveries have been reported to the *Mail* during the past few days—all in different sections of the country surrounding Phillipsburg—and in two of the cases we have seen specimens of the ore, one of which, in particular, would do the heart of a Wall-street goldbug good. The continual depression in the price of silver has greatly stimulated the sturdy prospector in his determination to find a gold mine, and that we have them right at our doors and adjacent to Montana's greatest silver-producing sections, is proven be-

yond dispute. The *Mail* believes that Phillipsburg will, in a short time, become the business center of hy far the greatest and most active gold as well as silver, mining section in the world. Go east, west, north, south, or at any intermediate point of the compass, and you will find rich prospects—hoth gold and silver. There appears to he one vast chain of a mineral helt snrronnding us, which in time, as a few of the discoveries are developed, will open its riches to the world. Of course, all these recent discoveries do not prove the existence of paying mines, but they do show, conclusively, that the precious metal is here and only awaits the hand of industry and capital to develop it, and gives encouragement to those who have spent years in their search for the glittering treasure to continne the hunt.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 28, 1892.

General trade continues about the same as reported last week. While isolated complaints are heard from iron workers, as a rule they are fairly well content with present business, notwithstanding the very small margin, owing to strong competitiou, of profit on contract work. With such large money reserves in the banks in this State, large railroad building and other important improvements under way, it looks very much as if we are on the eve of more prosperous times, particularly if we take into consideration the signs of a coming speculation in farm produce and farming land. The first speculative movement commenced in the products of the orchard, and with large profits in fruit, naturally, land adapted to fruit culture is appreciating in value. All information received from the East indicates that the long period of inaction that has prevailed there has been broken. Railroad and other leading American securities are in good demand at improving prices in the speculative centers. This increased activity is supplemented hy a steadily increasing call for funds, which is creating a firmer tone with capitalists and hankers in their demands for full interest on all money placed on approved security. The improved feeling at the East has strong support in the Government's statement of the foreign commerce of the country for the fiscal year ending with June 30th, and also to a turning of European investors to this country for profitable ventures. The Government returns for the fiscal year show that the total value of our imports and exports of merchandise attained its highest point, amounting to $1,857,726,910, as against $1,729,397,006 during the fiscal year 1891—an increase of $128,329,904, and an increase of $370,193,833 over 1889. The excess in value of exports over imports of merchandise during the last fiscal year was $202,944,342. The value of our imports of merchandise during the last fiscal year amounted to $827,391,284, as against $844,916,196 during the fiscal year 1891—a decrease of $17,524,912. The average annual value of our imports for the ten years, from 1882 to 1891 inclusive, has been $712,411,678. The imports during June were $72,004,743, against imports in June, 1891, of $73,462,225. The exports for June were $64,944,813 for 1892, against $57,594,734 for 1891. The value of our exports of merchandise during the fiscal year 1892 was $1,030,335,626, as against $884,480,810 during the fiscal year 1891—an increase of $145,854,816. The value of our exports of domestic merchandise was in 1892 $1,015,789,607, and it was the first year of our commerce when our domestic exports of merchandise attained to a billion of dollars. The figures of our gold shipmente show a very small excess of exports, while silver exports were considerable. The figures for the year ending June 30th are as follows: Exports of gold, $50,195,327; imports of gold, $19,698,342; excess of exports, $496,985; exports of silver, $32,810,559; imports of silver, $19,955,086; excess oi exports, $12,855,473; excess of exports of gold and silver combined, $13,352,458. The immigration for the year ending June 30th was 619,320, the largest of any year since 1882.

The lower freight rates hy sail hetween San Francisco and the Atlantic seaports are proving of great benefit to the general trade of this city. The low rates hy sail have, it is said, induced the railroad company to make hetter terms with shippers, hoth of which are proving of advantage to the wholesale trade.

SILVER—The market has fluctuated to some extent, hut the general tone appears to he fairly strong, considering the dullness nf trade reported hy all civilized countries. The general trade of the world, if the most reliable commercial and financial writers in all commercial countries can he accepted as authority, is shaping itself into a hetter situation lor more active times, and when trade and speculation are active there is a strong call for money, in which silver sympathizes and commands hetter prices. Aside from this, the International Bimetallic Conference promises good results, and may, in the end, he largely instrumental in raising the money standard of the white metal. The output of the mines in this country does not show any material decrease, neither does active prospecting work in the various mining districts, so far as reliahle public advices show, warrant the relief that there have been discoveries of silver-hearing ore worthy of special attention.

MEXICAN DOLLARS—There was shipped the past week $400,000 to China. The market is weak at around 68¾ cts.

QUICKSILVER—Receipts the past week aggregate 317 flasks, and exports hy sea, 200 flasks to Australasia and 30 flasks to Mexico. While the Eastern market steadily declines, our market is quoted at unchanged prices, notwithstanding sales at lower prices are reported to have heen made.

LIME—Receipts the past week aggregate 2660 barrels. The demand is still slow.

ANTIMONY—The market is harely steady. New York mail advices report a dull and easier market.

BORAX—Receipts the past week aggregate 900 centals. The market is essentially unchanged.

PIG IRON—The local market is reported ahout the same as has ruled for the past two weeks. Eastern mail advices report a heavy market for pig, but an active and higher market for structural material, hars and steels.

TIN—The market is quite dull for hoth pig and plates, with huyers still favorahle with cnncessions on asking prices. Both Eastern and foreign advices are essentially unchanged.

PIG LEAD—Tne market is weak. Eastern advices report more selling pressure, which causes a weak and somewhat irregular market.

COPPER—The market shows a little more strength, due to a hetter concentration owing to outside holders at the East selling out. London advices to July 20 report as follows: "Some firmness developed on rumors of purchases for the account of American operators, hut that was offset suhsequently hy the unfavnrahle statistical exhibit fnr the last fortnight, showing increase in stocks of 2270 tons. Chili charters were 1200 tons. Demand for consumption is at present rather quiet. Sales nf furnace material during the first half of the month included 1600 tons Anaconda malte, argentiferous, forward delivery, terms not transpired. Visible supply of copper in Europe increased 2083 tons during the fortnight."

COAL—Tacoma, 9420 tons; Newcastle, N. S. W., 3158; Nanaimo, 4524; Departure Bay, 5816; Coos Bay, 800; Seattle, 979. Total, 23,697 tons. The market is still reported well supplied. The consumption demand, although reported fairly active, is said not to he up to what had heen expected. For distant cargoes on passage and for cargoes for shipment there is a strong tone with a slight advance reported asked.

Mining Share Market.

SAN FRANCISCO, July 28, 1892.

Mining shares hung around at ahout hlackhoard prices up to yesterday, when a sharp decline set in greatly, to the relief of the hetter-informed operators who had almost despaired of the pnints put out for low prices heing touched for some time to come. Now that the low figures have been very nearly reached in the down move they look for much hetter times in the near future. There are others, again, equally well-informed, who are very confident that another line of assessment will he levied, and perhaps, collected, hefore the hig deal sets in. The writer does not pretend to know how the share market is to he manipulated, hut accepting previous deals as a fair guide, it is a safe proposition, to huy such shares as Yellow Jacket, Overman, Belcher, Crown Point, Kentuck [the latter mine lies hetween Yellow Jacket and Crown Point], Challenge, Potosi, Chollar, Sierra Nevada, Alpha and Occidental, with the market prices as low as they now are, for experience has taught that it is only a question of time when purchaser of low-priced shares, will, even if he pays one or two assessments, make hig money. The present drop in the market was arranged hy a master-hand and carried out in a most systematic manner. Strange as it may appear, it is said that a large number of operators sold their shares, some of whom even sold short, when they knew that D. O. Mills was on the coast.

They firmly helieve that Mr. Mills is opposed to any and all deals, for milling the ore extracted is good enough for him. Low water in the Carson river afforded a rare excuse for hreaking the share market. It will also give the rings an excuse to levy another line of assessments. Insiders are after certain shares, and their course indicates a firm determination of getting them before showing up any of the rich ore they have been developing to the west. It remains to he seen whether they will succeed in getting them at the outrageously low prices now current for the more important.

How times do change. Before the 1886 deal it was the managers of the North End mines who did the rohhing, etc., and outsiders were told to let the shares in that end alone. In consequence the shares of Con. Virginia, Best & Belcher and Ophir were concentrated and a hig deal was made in them. Now it is the managers of the Middle mines, and also the managers of the Gold Hill mines that are the rohhers, etc., and those who control Con. Virginia, Ophir and Best & Belcher are little angels, who would not take even a hot stove if given a chance. What will he the outcome time alone will tell.

A Nevada City paper says that Judge Hehhard is at that place examining the mills and mines. This is the only correct course to pursue for the application of the defendants in the Hale & Norcross suit, for a new trial will come up hefore him on next Monday, and by personally seeing how the mines are worked and the ore milled elsewhere, he can hetter judge how to rule. Judge Hehhard, evidently, helieves in personal knowledge. This is contrary to the general impression of how California Judges form their opinions, for it is the common helief that the ring of metallic currency controls in forming the opinion or a large majority.

For over four years the MINING AND SCIENTIFIC PRESS has contended for honest mine management on the Comstock. This has been down in the interest of the mining industry and also for the henefit of those outside shareholders who have heen persistently victimized. In its contention it was claimed that car sample assays were taken of all ore extracted and raised, and that they were kept from the public contrary to the mining laws of this State. Our assertions were strenuously denied, hut they were proven correct in the Hale & Norcross suit, and if anything was wanting it would as the following taken from a contemporary's review of the decision in the Hale & Norcross suit [the article in question has every evidence of heing inspired by the inside]: "When ore is hoisted from a Comstock mine, two samples are always taken for car assays. One of these is taken immediately after the car reaches the top, and is placed in what is known as the surface hox. The second is taken when the car arrives at the ore house, heing finally assayed for the different returns." The article in question further says that this system was "universally adopted at all mines as a check on ore values." If the car sample assays are good for insiders they certainly are good for outsiders, and under the laws the latter are entitled to the information. In this connection it is in place to recall the following frnm the puhlished statement in the PRESS of the testimony given in the Hale & Norcross suit: "D. B. Lyman, superintendent of the Con. Virginia Mining Co., testified that there was a difference of 10 to 12 per cent hetween car sample and battery assays—car samples heing the higher, and that mills should return not less than 65 per cent of the car sample assay. When asked hy Judge Hehhard what ore assaying $100 at the mine, hy car sample, ought to assay at the mill, he said, $90, and $15-ore hy car sample, at the mine, ought to assay $12.50 at the mill; that the Con. Va. mills were returning 74 to 75 per cent of the mine assay value. Jnhn W. Mackay testified that in early days they used to sell their ore to the mills, the mills paying 65 per cent nf the car sample or wagon assay value. Since that time there has heen a vast improvement in milling ores, and according to Mr. Mackay's estimate of selling the ore at 65 per cent of its assay value, Judge Hehhard's judgment against the ring for one million dollars is too small hy many thousands of dollars, instead of heing an outrage, as they would try to make the puhlic helieve in their latest attempt at mutilating facts.

San Francisco Metal and Coal Market.

ANTIMONY.			STEEL.		
Per lb	@	15	English, lb	— @	18
BORAX.			Canton tool	— @	8½
Refined, in car lots	— @	7½	Bl'k Diam'd tool	8½@	15
Powdered, do	— @	7½	Pick & Hammer	@	10
Concentrat'd, do	— @	6½	Machinery	4 @	5
All grades jobbing at advance.			Toe Calk	@	4½
COPPER.			TINPLATE.		
Bolt	22 @	—	B. V. steel grade		
Sheathing	22 @	—	14x20, spot	— @	6 00
Ingot, jobbing	— @	14½	Charcoal, 14x20	— @	5 00
Do, wholesale	— @	13½	Do roofing, 14x20	— @	6 00
Fire Box Sheets	22 @	24	Do, do, 20x28	@	12 00
IRON.			PIG TIN.		
Bar, base	— @	3	Spot ℔ lb	— @	24
Norway, base	— @	4½	COAL.		
PIG IRON.		Spot.	SPOT FROM YARD—PER TON.		
Eglinton ℔ ton	22 00@	—	Wellington	$8	00
Glengarnock	23 00@	—	Gretta	6	75
Am. Soft, No. 1	24 00@	—	Nanaimo	7	00
Oregon Pig	— @	—	Seattle	6	50
Puget Sound	— @	—	Coos Bay	5	00
Clay Lane White	24 00@	—	Cannel	8	00
Langloan	22 00@	—	Egg hard	11	50
Thorncliffe	23 00@	—	Cumberland, in sacks	14	00
Gartsherrie	22 00@	—	Do, bulk	13	00
Barrow	22 00@	—	Wallsend	7	00
Carnbroe	22 00@	—	Scotch Splint	7	00
CHROME IRON ORE.			Brymbo	6	75
Per ton	10 00 @	—	West Hartley	7	50
LEAD.			TO LOAD—PER TON.		
Pig	— @	4½	Australian	5 75@	—
Bar	— @	5½	Liverpool Steam	5 00@	—
Sheet	— @	7	Scotch Splint	6 00@	—
Pipe	— @	6½	Cardiff	6 25@	—
SHOT.			Lehigh Lump	12 00@	—
Drop, sizes *smaller* than B, ℔ bag of 25 lbs		$1 85	Cumberland	9 00@	—
Do do, B and *larger* sizes ℔ bag of 25 lbs		2 10	Egg, hard	10 00@	—
Buck, Balls and Chilled do, ℔ bag of 25 lbs		2 10	West Hartley	6 50@	—
QUICKSILVER.			COKE.		
Home trade, pr. flask		43 50 @44 00	Englisb, to load	$8 00@	9 00
For export		38 @	Do, spot, in bulk	—@10	00
			Do, in sacks	—@12	00
			Cumberland	9 00@	—

Eastern Metal Markets.

NEW YORK, July 27.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39⅜	86	11 50	4 05	20 65
Friday	39½	86¼	11 55	4 05	21 60
Saturday	39⅜	86½	11 65	4 05	21 00
Monday	39⅜	86¼	11 65	4 05	20 45
Tuesday	39 1-16	85⅞	11 65	4 05	21 45
Wednesday	39⅛	85½	11 65	4 05	21 40

Quicksilver is weak at lower prices. Borax is fairly steady. Pig tin has sold at still lower figures. Copper, while strong, is reported slow. Pig iron is still in buyers' favor.

NARROW BELTS.—F. H. Colvin, in the *American Machinist*, says: "Why will men (the shop managers in this case) never learn that a narrow belt is an abomination in general cases? Here is an emery wheel that does hard work, and we find a little two-inch helt attempting to drive it; the result is that the speed slacks down as soon as a heavy piece of work is put on it, and it needs relacing very often. Generally speaking, the helts can hardly he too wide, within reason of course, and the wide helt will he found to give the best results every time. The ideas of economy that we see displayed in so many cases in connection with helts give one a poor impression of the ability of many shop managers; it must he from lack of thought on the subject. The cost of a new helt, when needed, is far less than the time of the attendant when engaged in patching the old one.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alta S M Co. Nevada	42	15c	June 18,	July 26, Aug 16	L Osborn, 309 Montgomery
Belle Isle M Co, Nevada	14	10c	June 16,	July 21, Aug 12	J W Pew, 310 Pine
Bodie Cons M Co, California	14	25	June 20,	July 22, Aug 22	H D Walker, 309 Montgomery
Butte King M Co, Nevada	8	5c	June 4,	July 11, Aug 2	W C Lewis, 723 Market
California Verde Antique Marble Co, Cal	2	1c	June 12,	Aug 22, Sept 12	W J Garnett, 308 Pine
Commonweal h Cons M Co, Nevada	8	10c	June 15,	July 21, Aug 18	R R Grayson, 331 Pine
Con St. Gothard M Co, California	5	5c	June 9,	July 14, Aug 4	T Wetzel, 320 Sansome
Cons New York M Co, Nevada	8	10c	June 23,	Aug 2, Aug 23	C E Elliott, 309 Montgomery
Exchequer M Co, Nevada	33	10c	July 27,	Aug 31, Sept 20	C E Elliott, 309 Montgomery
Gold Mt M Co, California	3	$2	July 16,	Aug 20, Sept 8	J F Curtis, 325 Montgomery
Gould & Curry M Co, Nevada	69	25c	June 7,	July 12, Aug 4	A K Durbrow, 309 Montgomery
Gray Eagle M Co, California	29	6c	July 6,	Aug 9, Aug 13	A W Barrows, 303 California
Justice M Co, Nevada	51	40c	July 26,	Aug 31, Sept 19	R Kelly, 419 California
Kentuck M Co, Nevada	4	10c	July 15,	Aug 18, Sept 8	J W Pew, 310 Pine
Mexican Phosphate and Sulphur Co	1	10c	June 8,	July 18, Aug 8	A Halsey, 328 Montgomery
Ophir M Co, Nevada	58	50c	June 3,	July 7, July 27	E B Holmes, 309 Montgomery
Per M Co, Arizona	13	10c	July 19,	Aug 25, Sept 23	A Waterman, 309 Montgomery
Peerless M Co, Arizona	18	5c	July 5,	Aug 11, Sept 7	A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	6c	July 11,	Aug 14, Sept 12	G R Spinney, 310 Pine
Sierra Nevada M Co, Nevada	102	25c	June 10,	July 13 Aug 2	E L Parker, 309 Montgomery
Union Cons M Co, Nevada	46	20c	July 18,	Aug 24, Sept 13	A W Barrows, 303 California

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Cons New York M Co, Nevada	Annual	O E Elliott, 309 Montgomery	Aug 6
Derbec Blue Gravel M Co, California	Annual	T Wetzel, 320 Sansome	Aug 2
Jack Rabbit M Co, Nevada	Annual	T Wetzel, 320 Sansome	Aug 8
Julia Cons M Co, Nevada	Annual	J Stadfelt, 309 Montgomery	Aug 20
Live Oak Drift Gravel M Co, California	Annual	E Caeminant, 313 Montgomery	July 30
South Feather W & Union Co, California	Annual	J Coffin, 220 California	Aug 8

LATEST DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	10	T Wetzel, 310 Pine	July 18
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H F Bast, 301 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	July 11
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 8.		WEEK ENDING July 13.		WEEK ENDING July 20.		WEEK ENDING July 27.	
Alpha	.20	.30	.20	.28	.20	....	.15	....
Alta	.15	.20	.20	.25	.25	.30	.25	.30
Andes	.40	.45	.40	.45	.35	.40	.35	....
Belcher	1.25	1.95	1.25	1.65	1.15	1.35	.85	1.15
Belle Isle	.05	....	.05	....	.05	....	....	....
Best & Belcher	1.60	1.95	1.60	1.90	1.55	1.90	1.50	....
Bullion	.50	.60	.50	.55	.30	.50	.30	.35
Bodie Con	.15	....	.20	....	.10	.15	.30	.35
Bulwer	....	....	.45	....	.40	.45	.40	.45
Commonwealth	....	....	....	....	.05	.15	....	....
Con. Va. & Cal	3 35	3.85	3.60	3.90	3.60	3.85	3.50	3.65
Challenge	.50	.65	.50	.60	.40	.50	.30	.35
Chollar	.76	.85	.65	.80	.60	.76	.45	.60
Omnibus	....	....	1.80	....	....	....	....	....
Con. Imperial	.05	....	.05	....	....	....	....	....
Caledonia	.20	.30	.25	....	.20	....	.20	....
Crown Point	.80	1.25	.90	1.15	.75	.95	.55	.75
Crocker	....	....	....	....	....	....	....	....
Del Monte	....	....	.05	....	.05	....	.05	....
Eureka Con	....	....	2.25	....	....	....	....	....
Exchequer	.15	....	.15	....	2.10	....	.10	....
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.70	.95	.85	1.10	1.00	1.05	1.00	....
Hale & Norcross	1.35	1.50	1.30	1.40	1.20	1.35	1.10	1.20
Julia	.05	....	.05	....	.05	....	....	....
Justice	.15	.20	.15	....	.15	....	.10	....
Kentuck	.15	....	.10	.15	.15	.10	.05	....
Lady Wash	....	....	.10	....	....	....	....	....
Mono	.35	....	.40	.45	....	....	.30	....
Mexican	1.40	1.70	1.66	1.70	1.60	1.70	1.35	1.55
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	....	....	.05	....	....	....	....	....
Nev. Queen	.45	.60	.30	.45	.36	.55	.20	.45
Occidental	.30	.40	.35	....	.35	....	.30	....
Ophir	1.50	*2.60	2.35	2.80	2.50	2.75	2.30	2.65
Overman	.50	.75	.60	.70	.40	.50	.30	.40
Potosi	.55	.70	.45	.70	.40	.60	.40	.50
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	.06	....	....	....	....	....
Savage	1.40	1.60	1.30	1.55	1.10	1.30	.95	1.10
S, B. & M	.25	.35	.30	.35	.25	.30	.20	....
Sierra Nevada	.75	1.00	.90	*1.20	1.15	1.25	.95	1.06
Silver Hill	.05	....	....	....	.05	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.85	1.25	.95	1.10	.85	1.10	.70	.85
Utah	.06	.10	.05	*.35	.25	.30	.20	.25
Yellow Jacket	.85	1.00	.80	1.00	.65	.86	.40	.65

*Assessment added.

The Benjamin Electrical Pickling Process.

Mr. George H. Benjamin, of New York, has invented and recently patented a process of pickling black plates hy electricity. In the usual method, the plates which are to he tinned are immersed in a weak solution of sulphuric acid and afterward rubhed hy hand to remove dirt, grease and rust. In Mr. Benjamin's apparatus a tank contains the cleaning liquid, a solution of sulphate of soda or sulphuric acid, for example, and has a positive electrode, preferably an iron plate, and a crate carrying the plates to be cleaned, which forms the negative electrode. When a dynamo is connected with these electrodes, an electrolytic action takes place, oxygen being set free at the positive electrode and hydrogen at the negative. This hydrogen set free from the surface of the plates serves to reduce the oxides on the surface, and also to decompose any grease that may he present, as well as incidentally to cause any accumulation of dust or dirt that may he upon the plates to drop off. Ordinarily it is sufficient to charge the plates in a solution of sulphuric acid and water, continuing the current from fifteen minutes to three-quarters of an hour. Where the plates are very much covered with grease, they may he immersed first in a solution of sulphate of soda, chloride of sodium, or any other solution of a neutral salt and charged for about fifteen minutes, and subsequently introduced into a solution of sulphuric acid in water and charged as above described. Where the plates are very dirty—that is, are covered with a great deal of rust—it may he necessary to continue the current while they are immersed in the sulphuric acid hath for a longer period. After charging, the plates are removed from the hath, rinsed with fresh water, and then dried hy rapid heating, after which they are ready for the tinning hath.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 19, 1892.

479 238.—AIR SUPPLY FOR GAS MACHINES—E. B. Badlam, S F.

479,051.—STEP LADDER—L. E. & A. E Bowser, S. F.

479 390.—ELEVATOR—M. Y. Calcutt, Seatile, Wash.

479,055.—LID LIFTER FOR KETTLES, ETC.—A. E. Cobb, Phœnix, A. T.

479,117.—NEEDLE EXHIAITNG CASE—E. R. Denny, Spokane, Wash.

479,253.—AIR DUMP CAR—C. H. Dow, Tacoma, Wash.

479,258.—RAILWAY SIGNAL—S. Emrich, Reno Nev.

479,104.—LOCK—Fleischal & Bertrand, S. F.

479,280.—COPYING DEVICE—J. C. Ingram, S. F.

479 281.—CULTIVATOR—Johnson & Olson, San Jose, Cal.

479,286. — BLACKSMITH'S FOAGE — Lenzen & Heckenroth, San Jose, Cal.

479,238.—BOILER—J. R. Lutgen, Castle Rock, Wash.

479,094.—AORICULTARAL IMPLEMENT—M Macleod, Los Angeles, Cal.

479,146.—AMALGAMATOR, ETC.—L. C. Moreland, Ogilhv, Cal.

479,011.—CAN OPENER—C. Morgan, L tah, Wash

479,296.—ROPE-GUIOING SHEAVE—Sam'l Murray, S. F.

479,308.—ALARM SIGNAL APPARATUS — Paul Seiler, S. F.

479,081.—SUSPENSION BAIDGE—G. A. Stephenson, Los Angeles, Cal.

479,099.—CAN STAND—E. Thomas, Los Angeles, Col.

479,235.—WATER GAUGE—W. A. Woods, S. F.

The following brief list by telegraph, for July 26, will appear more complete on receipt of mail advices:

California—Charles F. Baxter, Marietla, shipper's folding crate or coop; Archibald Ford, Golden Gate, apparatus for reducing bituminous rock; Byron Jackson, San Francisco, pneumatic feeding apparatus for straw; Joseph F. Klog, Mont Alvo, bean harvester; Andrew K. Longnecker, Elk Grove, fruit packer; Ernest McCullough, San Francisco, spirit level; Nathan W. Moody, Fresno, miner's tool; Robert F. Nichols Sr., Altnras, motor.

Washington—Grosveoor S. Andrus, Walla Walla, weed cutter; Nathan Cosman, Seattle, kettle cover; Rloaldo S. Robertson, Artondale, adding machine.

Arizooa—Charles W. Miller, Clifton, label holder.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CULTIVATOR.—Charles Johnson and Otto Olson, San Jose. No. 479,281. Dated July 19, 1892. The main object of this invention is to provide a cultivator the frame of which is so constructed that it is adapted to be readily converted from a two-horse cultivator into a single or one-horse cultivator, and vice versa.

BLACKSMITH'S FOAGE.—T. W. Lenzen and L. Heckenroth, San Jose. No. 479,286. Dated July 19, 1892. The objects of this invention are to provide means for introducing the air to the fire in a heated condition, whereby more perfect combustion is had; to introduce it in such a manner as to concentrate it on the working basis or seat of the fire; to provide for an easy discharge or removal of the slack without disturbing the fire, and to provide for a perfect regulation of the current of air and a convenient discharge of the cinders, these several objects being attained, respectively, by the arrangement of the air-passages, the shape of the fire-receptacle, and the provision of the bottom-lock.

AIR-SUPPLYING DEVICE FOR GAS MACHINES. Edgar B. Badlam, S. F. No. 479,238. Dated July 19, 1892. This machine for proportioning mixtures of air and hydrocarbon vapor is employed in conjunction with machines in which inflammable vapor or gas is produced by passing air through a volatile hydrocarbon, this vapor when mixed with a proper quantity of atmospheric air being suitable for illnminating purposes. The object of the invention is to provide an apparatus hy which a variable amount of air may be accurately supplied to the carburetor and another volume simultaneously mixed with the vapor after it has been produced in the primary portion of the apparatus.

COPYING DEVICE.—Joseph C. Ingram, S. F. No. 479,280. Dated July 19, 1892. The device is intended for copying letters and either written or printed matter. It consists of a roller adapted to receive the impression from the written sheet and transfer it to the copying-sheet, a hox with slotted sides, within which said roller is contained, a cleansing device situated in the hottom of the hox, and a means for rotating the roller in contact therewith. When a page has been prepared for copying, it is onlv necessary to place the roller in contact with one end of the sheet and rotate it over the page, when the characters inscribed thereon will be transferred to the surface of the roller. From this roller the characters are readily transferred to any desired numher of sheets where the characters are to he reproduced.

ROPE GOIDING SHEAVE — Samnel Murray, S. F., assignor of one-half to Wm. F. Murray. No. 479,296. Dated July 19 1892. This is a guiding-sheave for ropes, the object of which is to enable the operator to provide for any change of direction of rope through which power is to be transmitted. The h se-plate corrying the roller or sheave is adapted to he fixed or secured in any suitable position, either upon the deck of a vessel, upon the hits of the windlass, or in any place where it can he conveniently employed. By means of peculiar disks and flanges, the combinations are arranged which enable the operator to lead a rope in any desired direction, ood always approaching the sheave and leaving it so as to move in the plane of rotation of the sheave and lead fairly.

ELECTRIC FOG SIGNALING.—"So far as appears from the present outlook, future telegraphic progress promises no great resnlutinns. Method and means will, no douht, become more and more refined, and greater speed be attained," says Prof. Elibu Thomson in the July *New England Magazine* The more general introduction of multiplex systems will increase the capacity of the lines and decrease the costs, and more attention will be given to permanence nf lines and to securing immunity from extended interruptions due to storms. It may be remarked here, however, that electricians are not without some hope that signaling or telegraphing for moderate distances withou wires, and even tbrough dense fog may he an accomplisbed fact soon. Had we the means of obtaining electric oscillations of several millions per second, or waves similar to light waves, but of vastly lower rate of vibration, it migbt be pnssible hy suitable reflectors to cause them to he carried a mile or so through a fog, and to recognize their presence by instruments constructed for the purpose. Many of the difficulties and dangers wbicb now beset the navigator would at least, he lessened, if not removed Signaling or telegraphing without wires is no new proposal, and there bave been many such proposals whicb are extravagant and impracticable. The fact is, bowever, the essential means are not yet forthcoming.

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Assessment Notices.

NOTICE OF ASSESSMENT.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 12th day of July, 1892, an assessment (No. 2) of One Cent per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 3 8 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 22d day of August, 1892, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 12th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors.

W. J. GURNETT, Secretary

Office, 3 8 Pine Street, San Francisco, California.

DELINQUENT SALE NOTICE.

THE BUTTE KING MINING COMPANY. LOCATION of principal place of business, San Francisco, California. Location of Works, Butte County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 4) levied on the 4th day of June, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
V. Gadesden	250	50	2 50
E. Clarke	15	20	1 00
E. Clarke	62	30	1 50
R. M Pogson	13	200	10 00
F. H. Abbatt	18	100	5 00
A E. Mintie	49	1,000	50 00
A E. mintie	188	1,000	50 00
A. E. Mintie	162	75	3 75
M. A. Carpenter	54	500	25 00
F. W. Spencer	230	2,000	100 00
F. W. Spencer	267	5,000	250 00
F. W. Spencer	268	3,000	150 00
L. C Mintie	87	1,000	50 00
L. C. Mintie	139	1,000	50 00
L. E. Winans	97	100	5 00
L. E. Winans	211	400	20 00
J. Schoo craft	110	50	2 50
J. Schoolcraft	148	50	2 50
J. K Secord	112	500	25 00
M. Secord	113	500	25 00
J. H. Elwood	114	100	5 00
J H Elwood	115	100	5 00
J. H Elwood	116	100	5 00
J H Elwo d	117	100	5 00
J. H. Elwood	118	100	5 00
W. H. Brundidge	119	1,000	50 00
J. Morton	125	500	25 00
F. C Mintie	126	40	2 00
F. C. Mintie	137	10	50
W. L. Woodrow	128	300	15 00
E. H. Woodrow	129	100	5 00
C. Burchard	135	50	2 50
V. Neale	169	1,000	50 00
V. Neale	171	500	25 00
V. Neale	173	1,000	50 00
V Neale	174	1,000	50 00
V Neale	175	1,000	50 00
Mrs. G J. Koenig	189	1,000	50 00
S. A. Winans	191	1,000	50 00
W Lichtenberg	199	400	20 00
E. Mayo	246	100	5 00
W. M Pierson	257	250	12 50
R. B Mitchell	268	250	12 50

And in accordance with law, and an order of the Board of Directors, made on the 4th day of July, 1892, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 723 Market St., San Francisco, California, on TUESDAY, the second day of August, 1892, at the hour of 3 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

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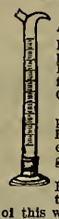

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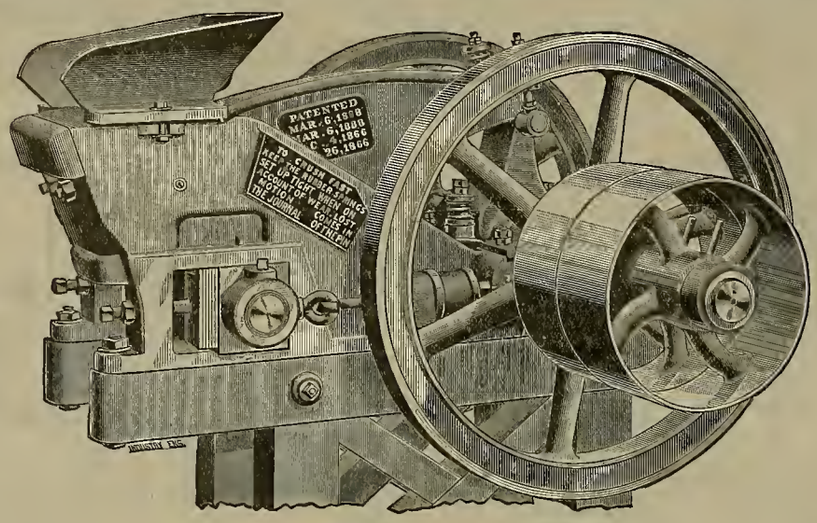

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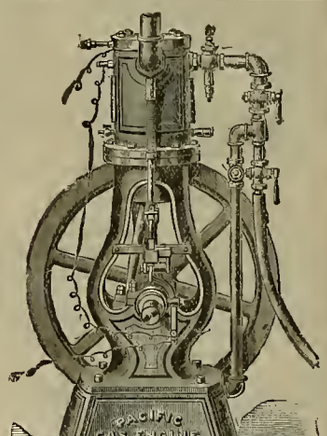

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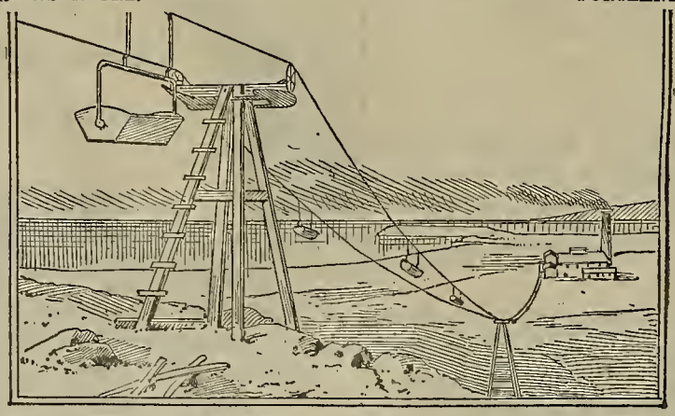

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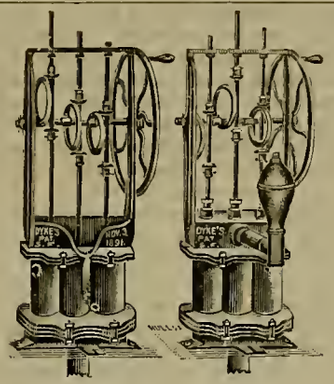
VOL. LXV.—Number 6.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, AUGUST 6, 1892.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

A Triplex Pump.

This pump, recently patented by Hugh J. Dykes of Peralta, Alameda Co., and manufactured by Stewart & Trowbridge of Berkeley, is one of that class in which are embodied a number or series of separated cylinders, with a common inlet and common discharge and each having pistons which are operated successively to produce a continuous stream. The object of the inventor is to provide a simple pump of this class in which the total capacity is so divided as to materially reduce the power necessary to operate the members separately, and yet effect as a sum of the operation of all, a result equal to the sum of their capacities. By the peculiar construction, Mr. Dykes claims that the distribution of the labor or power required to operate the pump is equal in all parts of the circle. It is specially adapted for deep well irrigation or ship use. It may be run by hand, or any power may be applied. For windmill work it avoids uneven and irregular motion. The cuts readily show the application and construction, the cams and pistons being shown in two positions.



THE DYKES TRIPLEX PUMP.

The Metric Model.

The accompanying cut is from a photograph of an apparatus invented and just patented through the MINING AND SCIENTIFIC PRESS Patent Agency by James Mc Court of Salem, Oregon. It is intended to illustrate and explain the decimal system, and particularly the metric system of weights and measures. It will be a valuable school room help, as it shows objectively all that is claimed for it. It can be used to illustrate coinage, numeration, etc., to beginners, and proportion, progression, logarithms, etc., to the advanced pupils. As an expounder of the metric system, which is now used so extensively among the civilized nations of the world, it is useful as showing all the standards at full size. The apparatus consists of two blocks substantially as shown above; the small one is the cubic diameter and the large one the cubic meter.

In its application to numeration and coinage, *A* shows (10) units or cents (10 mills); *A*, *B*, tens or dimes; *A*, *B*, *C*, hundreds or dollars; *A*, *B*, *C*, *D*, thousands or eagles (closed block).

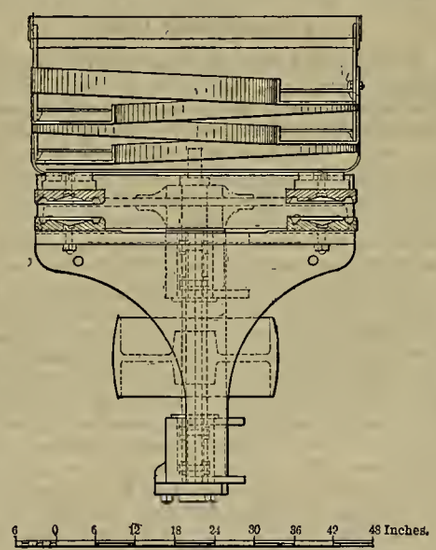
The following shows its application to the metric system, so far as weight and liquid and dry measures are concerned, and sufficient to show its working:

Weight (small block cu. dm.)—*A* shows the gram, full size; *A*, *B*, the dekagram, full size; *A*, *B*, *C*, the hectogram, full size; *A*, *B*, *C*, *D*, the kilogram, full size.

In liquid and dry measure (large block cu. m.), *A* shows the liter, full size; *A*, *B*, the dekaliter, full size; *A*, *B*, *C*, the hectoliter, full size; *A B*, *C*, *D*, the kiloliter, full size.

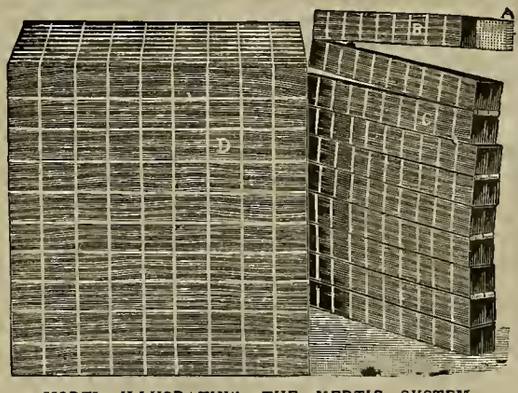
Gyrating Screen for Sizing Mineral.

In the gyrating screen shown on this page, intended for cleaning and sizing coal at a mine, is an approximately horizontal screen which is given a gyratory motion like that the moulder gives to his sieve when screening his sand. Its great advantage is that the whole surface of the screen is constantly in action, while on a revolving screen only one part is at any one time in action. The problem of constructing a gyrating screen when it is to be large, and must make a great number of sizes, is to support it in such a manner that it will gyrate easily and safely and, at the same time, that it will be self-contained, so that the centrifugal force will be counterbalanced and will not shake the building. This has been done successfully. The method consists essentially in supporting one horizontal plane above another by means of three or more double cones, while the motion of gyration is given to the upper plate by a crank upon a shaft passing through and journalled on the lower plate. The cones roll freely in a prescribed path on the lower plate. There are several forms of these screens, the cut showing the single one. The upper plate is the screen-box. On the shaft shown



SINGLE GYRATING SCREEN FOR COAL.

in the bed-plate a pulley is placed to drive the screen. The large wheel shown between the screen-box and the bed-plate is counter-weighted to balance the centrifugal



MODEL ILLUSRATING THE MERTIC SYSTEM.

force of the screen-box. Above this wheel is a crank to drive the screen-box. The box is 4 feet wide and 6 feet long, inside measurement, giving 24 square feet of screen surface per shelf. The number of shelves in this type varies from two to six, depending upon the size of material to be screened. The smaller the size of coal, the closer to each other the shelves can be put.

The Geological Survey.

In the interest over national politics and partisan measures, the Congress now in session seems to pass over with easy indifference a number of measures which mean a great deal for the general welfare of the country. One of the most short-sighted policies inaugurated is the war made upon the U. S. Geological Survey by reducing the appropriation for this work. If we understand the bill correctly, the paleontological and the chemical departments are cut out almost entirely, and the general geological force so reduced as to effectually stop field geological work for the present session at least. The topographic division is not so seriously affected, although the number of geographers is materially reduced.

The Geological Survey was organized in 1879 by consolidation of the Geological Survey of the Territories, called the "Hayden Survey;" the Geographical Surveys west of the 100th meridian, called the "Wheeler Survey;" and the Geological and Geographical Survey of the Rocky mountain region, called the "Powell Survey." This was done in accordance with the recommendation of the National Academy of Sciences, to meet the general opinion of scientific men in the United States, and to avoid any possible duplication of work. For a little over a year Clarence King was the director, and then almost by acclamation Major John W. Powell was appointed at the head of the Bureau. Under Powell's able leadership, the survey was established upon a business and workman-like basis, and the result of his work and management has called forth most splendid recognition from Paris, from Vienna, from Heidelburg and from St. Petersburg.

In our own country the encomiums are not so enthusiastic or so general. For, alas our legislators create only to destroy, and cripple scientific research at the very moment when it is in a position to do the most good.

A scientific observer will say, What can the Geological Survey do without a paleontologist to determine, by fossil classification, the ages of a respective series of rocks, or of a chemist, by analysis, the nature and material of the ledges? With information furnished by these assistants, in their special lines, the general economic or historical geologist is enabled to classify and describe formations, and thus distribute a guide for more practical deductions in the hands of the mine expert or ordinary prospector. The management of the Geological Survey, as is bound to be the case with any large organization, is not above criticism. We would suggest a more rapid publication of results already collected in accordance with existing regulations of the government printing office; a publication of the topographic maps if possible prior to the geological colored sheets, separately if practicable as a guide for the surveyor and traveler; and more care used in the appointment of specialists, so that each State, particularly in the West, should be represented by a specialist familiar with the needs and wishes of his respective locality.

To the mind of the average intelligent reader, there can be no doubt but that the work should be carried on in accord with the general scheme of the past few years, and appropriations should be increased rather than diminished. It is to be hoped that if an extra session of Congress is called by the President, an attempt will be made to restore that part of the appropriation at present taken from the survey, and as the organization corrects these various faults, a bureau upon a firm basis should be established, of pride to our own country and the world at large.

THE pay roll of the United Verde Copper Co., Arizona, foots up from $14,000 to $15,000 per month.

MINING AND SCIENTIFIC PRESS.

BY THE DEWEY PUBLISHING CO.

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☞ *Take the Elevator, No. 12 Front St.* ☜

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W. B. EWER, CHAS. G YALE, } ..... EDITORS

ALFRED HOLMAN ..... MANAGER

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO, SATURDAY, AUGUST 6, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Books—Henry Carey Baird & Co., Philadelphia.
Dividend Notice—Pacific Coast Borax Co.
Assessment Notice—Gover Mining Co.
Position Wanted—Box C, this office.

☞ *See Advertising Columns.*

Amending the Hydraulic Mining Bill.

Had it not been for the fact that Senator Felton, of California, desired to suggest some amendments to the Caminetti bill as it passed the House, it would have been considered by the Senate before this. Messrs. Felton and Caminetti have had a conferrence on the subject, and Mr. Felton says the amendments proposed by him and accepted by Caminetti to-day are about 30 in number, and most of them immaterial, being merely changes in the phraseology. Two of them, however, are important. One provides a penalty of from $1000 to $5000 fine for violation by the miners of the conditions imposed by the United States Mining Commission; another amendment changes Section 24, and provides that the Government commission may confer with the California State Commission, if the latter is so authorized by the legislature, concerning the drainage of the rivers and the reclamation of river lands, such plans to be approved by the chief engineers of the War Department; but the following clause, which was objectionable to some of the river and valley men of California, has been stricken out, viz.: "The consent of the United States, in so far as it is necessary to confer the same on account of its reserved control over said navigable rivers, is hereby granted to the State of California, or any municipal or local organization authorized by the laws of said State, to construct said works at its expense; provided that whenever the navigable waters of said system are or may be affected thereby the plans therefor shall be resumed by the commission created by this Act and approved by the Chief of Engineers of the United States Army."

The understanding now is that the Senate Committee will report the bill favorably this week, which should insure its passage, as the amendments simplify the bill. The fact that the platforms of both the Republican and Democratic parties of California indorse the miners' position has had great influence to a favorable consideration of the bill. The resolutions adopted by the two party conventions have been printed and distributed among the members of Congress to direct attention to the importance of the bill. A strong effort will be made to pass it before adjournment.

While the matter is being considered in Congress, the Anti-Debris Association is calling for a convention of five of the valley counties at Sacramento on Saturday, to fight the whole proposition on general principles. The leaders of this movement are men who were invited to come and confer with the miners at their convention. They did not come, but do not return the compliment. In fact, they desire no conference, having their own fixed opinions which no mere facts could not change. They want to continue to thrash over the old straw and renew the old agitation. They ignore the fact that the miners want to impound the debris, and they oppose the building of dams as dangerous, though the engineers state there can possibly be no danger, as the dams are for sand, not water. They set up their opinions as against those of skilled engineers, misquote the report of said engineers, and endeavor again to arouse the old feeling of warfare between the two classes. And all this because certain miners kept on at work when they should not have done so. The Miners' Association did all they could to prevent this, but it is impossible to make all men act decently when self-interest is at stake.

It is not probable, however, that the acts of the proposed convention will have any special influence at this time. Five years ago it would have been different. But there is a disposition now to give the miners a show. They have been the "under dogs" in the fight too long. These valley farmers are thoroughly selfish in this matter and do not wish any plan adopted which will again let the miners resume their work. They place no faith in dams or restraining works, and want no trials made. The public, however, thinks differently and want the miners to see what they can do toward keeping their debris back. If the attempt is a failure it will be time to stop them then. But for a lot of men whose occupations are entirely different from mining to sit in judgment as to the way miners should work, is absurd, to say the least. A few representatives of five counties should not be permitted to set the rule for the rest of the State on a matter of this moment. The miners invited to their convention every county in the State, valley and mountain; but the farmers of the valley will talk only among themselves. They will find, however, that the people of this State want the gold in those mountains and if there is a way of getting it out they want to see it tried; and now that Congress is about to provide a means of trial, little attention will be paid to the selfish remonstrances of interested parties.

A Rock-Drilling Contest.

Following the lead of the Denver and Helena National Mining Conventions, the State Agricultural Society of California intends, in connection with the forthcoming mining exhibit at Sacramento, to arrange for a rock-drilling contest. The trial of skill will consist of single and double hand drilling in granite, as it is not practicable to obtain quartz of sufficient dimensions and having the proper uniformity of character. Contestants will have to furnish their own tools. The duration of each match will be 15 minutes, whether for single or double hand contests. All contests will be held in the evening in the State Agricultural Pavilion by electric light and be presided over by time-keepers, judges and measures to be appointed by the committee. The size of the steel in single-hand contests will be five-eighths inch octagon and for double-hand seven-eighths inch octagon. The trophies will consist of handsome gold medals and cash prizes for the champions and cash prizes of smaller amounts for the second and third teams. This will be the first event of the kind in California, and it is intended that in case the winners shall belong to this State, they shall challenge the Colorado and Montana champions to similar contests at the World's Fair next year. The winners at the Helena, Mont., contest of double-hand drill work made a record of 33 5-16 inches in 15 minutes and of the single-hand drill work of 22 11-16 inches.

The proposed contest will attract considerable attention among working miners and the general public, but the mine owners would be more interested in a competitive trial of rock-drilling machines rather than men. In these days machine labor in rock-drilling has so far displaced hand labor that such personal contests have no longer the value they formerly had. It is only in the smaller mines that this work is done by hand. All mines of any size use machine drills, of which there are various types. They do the work so much cheaper and quicker than men can do it that no mine is properly equipped without them.

An Improved Water Gauge for Boilers.

In the usual construction of water gauges, a single vertical glass tube has its upper and lower heads connected respectively with a chambered metal head, these heads being attached to the boiler above and below the water line, the glass tube being secured at each end in a stuffing-box to prevent leakage. This construction prevents any draft of cold air from the outside to strike the heated glass tube, which is very liable to break, and the connection at the stuffing-boxes is such that the tubes often break, especially at the lower stuffing-box, by reason of the unequal strains, etc. William A. Woods of this city has patented through the MINING AND SCIENTIFIC PRESS patent agency an improved gauge which overcomes these objections by providing a protection for the glass gauge, by surrounding it with an exterior tube with a nonconducting column of air between them.

The outer glass fits in a collar above and below. The upper collar is movable, permitting the glass to slide vertically when desired. At the lower end of the gauge is a small wheel operating a screw controlling the lower collar. The inner glass rests, at both top and bottom, on rubber gaskets and by means of the wheel the movement is corrected vertically, so as to raise or lower the glasses and center the inner glass steam tight in its gaskets. By this means, should the inner glass break it is readily and quickly removed and a new one substituted, without any trouble in repacking. The outer glass can also be easily changed. The inner or water glass itself, being covered by a second and larger glass tube, is not subject to drafts of cold air which cause breakage. Perforations are made in the upper collar which prevent the glass becoming clouded, so that the inner tube can always be seen. The owner of this patent is in the East making arrangements for the manufacture of this water gauge on a large scale. Being a safety device, as guarding the water glass from breakage by drafts of cold air, this gauge is specially useful for locomotive boilers, although it is adapted for general use on all sorts of boilers.

Foundry Notes.

AS STATED in the MINING AND SCIENTIFIC PRESS two weeks since, the Fulton Iron Works has not definitely settled on building their new plant at Baden, although that point had been under consideration. The Hays tract, at the foot of Union street, Oakland, and fronting the harbor, offers an eligible site, and the new works will be put there provided the citizens of Oakland raise the desired bonus of $50,000. The Oakland Water Front Company has offered inducements independent of those tendered by the citizens of Oakland. As the matter now stands it all rests with the citizens. If they can raise the $50,000 bonus agreed upon, the site will be selected. The place is the Hays tract at the foot of Union street and extending almost to First. The tract comprises 42½ acres. It is adjoining the large switching and engine yards of the Southern Pacific Company at the end of the mole. Between the Hays tract and the Oakland harbor is a strip of land belonging to the Oakland Water Front Company. This the company will sell at a very reasonable figure, or sell a strip 600 feet wide so as to give the iron works a good frontage, with the privilege of buying the rest later. Mr. Spiers states that the offer of the Water Front Company is satisfactory to his company and it will not be their fault if the scheme falls through. It is the intention of the Fulton Works, if they take this site, to fill in the marsh land and to excavate a dock. The iron works and shops will be built on both sides of the dock. A committee of citizens of Oakland is now engaged in soliciting subscriptions to the bonus and some $4000 of the amount has already been pledged. If, however, the amount desired is not raised, it is probable the new works will be put up at Baden, for the owners of that property hold out very liberal inducements.

THE Engineers and Iron Founders' Association of California was organized in this city to oppose the molders' strike and succeeded in defeating the Molders' Union after a long and bitter contest. It is composed of the firms engaged in the general foundry business and supported by their subscriptions. Where special subscriptions are necessary, they are proportioned to the importance and volume of business of the works. The association is in a prosperous condition. At the annual meeting on Monday, Ira P. Rankin, the president, having retired from active business, declined a renomination. A vote of thanks was tendered the retiring officers for their successful management of the affairs of the association, and the following directors were elected for the ensuing year: James Spiers of the Fulton Iron Works, William H. Taylor of the Risdon Iron Works, L. C. Marshutz of the National Iron Works, A. Chartrey of the J. Hendy Machine Works, and Wales L. Palmer of the Golden State and Miners' Iron Works. Representatives of all the shops connected with the association were present and stated that harmony prevailed between the employers and workmen.

THE Pacific Mail Steamship Peru, recently launched at the shipyards of the Union Iron Works, and the largest commercial steamship yet constructed on this coast was speeded on her trial trip over the Government Course from Pigeon Point to Point Sur on Sunday last. The course is 58 nautical miles, a little more or less, and to earn the Government subsidy the steamer had to show a speed of 14 knots, or to cover the distance in a few minutes over four hours. She actually covered it in five minutes under the four hours, showing an average speed of 14.96 knots during the test. Her best running was during the middle of the course, when the steamer held 15 knots for three consecutive hours. The run commenced at 2 h. 21 m. 20 sec.; it closed at 6 h. 16 min. 20 sec., so that the run had been made in 3h. 55 min., and the Peru had six minutes to spare. Her speed over the couree was officially given as 14.96 knots; had she got in half a minute sooner it would have been 15 knots. The Peru is 334 feet long, 45 feet beam; mean draft 19 feet; displacement, 4450 tons. The vessel left for China this week on her maiden voyage.

Coast Industrial Notes.

NEW and improved cars have been put on the San Diego electric street railway.

PETALUMA'S new silk factory will be ready for work in a few days, the building having been completed.

THE Rio Grande Western has put a force of men at work laying track westward from Salt Lake City.

STEPS are being taken for the development of the artesian belt of Alvarado with a view of supplying the town of Haywards.

SALEM, Oregon, is extending its street railway system, and is also making telephone connections with neighboring towns.

PROPOSALS are advertised for the improvement of Alamo square in this city, for which the $15 000 appropriated by the Supervisors is now ready.

THERE is again talk of developing the nickel mines at Olalla, Oregon. The mines have been known a long time, but they have never been properly opened.

THE brick engine and car house of the Point Lobos and Geary Street car line is approaching completion at the northwest corner of Point Lohos and First avenues.

NEARLY all the buildings at Vacaville injured by the earthquake of last April have been repaired, and in every case the buildings erected have been improvements on the old ones.

THE machinery at the iron-plating shop at Mare Island, recently set up, is in operation, being driven by the new Corliss engine. The machinery in the smithery will also soon be connected with it.

ENGINEERS are at work toward changing the Berkeley horse car line into an electric road. Colonel Meyers, of the California Railway Company, says that the transformation will be made within the present year.

THE last carload of oranges for the season of 1891–92 has been sent forward from Riverside, San Bernardino Co. The shipments of oranges and lemons from that settlement during the season foots up a total of 402,030 boxes, or 1406 carloads.

THE Regents of the University of California have advertised for bids for the construction of a building for a new department of the university, to be known as "the mechanical and electrical engineering department of the University of California."

THE East Oakland Street Railway Company has recorded a mortgage to-day on all their estate, rights and franchises for $250,000 to the California Safe Deposit and Trust Co. The mortgage was effected to secure 6 per cent bonds, to be issued by directors.

A NUMBER of employes of the Carson Mint have been paid off. The mint appropriation was reduced $11,000 for labor and $4000 for supplies this year, and the institution has been closed down to await the appointment of a new superintendent to succeed the late Samuel Coleman Wright.

THE Tuscarora Water Co. has held its annual meeting and has elected the following directors: P. C. Hyman, Thomas Bell, Daniel Meyer, John R. Spring and W. E. Davis. P. C. Hyman was elected president; Thomas Bell, vice-president; J. W. Pew, secretary, and H. W. Coffin, superintendent.

A STRIKE of red oil at a depth of 80 feet is reported in the Buena Vista oil fields, 36 miles west of Bakersfield, Kern county. The well has a capacity of 25 barrels a day, but pumps will he necessary. It is claimed tbat this oil has a paraffine instead of the usual asphaltum base of the California oils.

WHILE in the Mare Island dry dock, the work of strengthening the stern of the Monadnock will be prosecuted. She will ultimately be provided with new propellers of an improved pattern. A large gang of men are at work aboard of her and on various parts of her outfit and engines in the shop.

AT the Mare Island Navy Yard, the Ordnance Department has a small force employed in necessary work. The new buildings proposed for preparing ammunition will probably be located near the naval cemetery, between two hills, where danger will be less liable to surrounding property in case of another accident.

FRANCHISES have been granted for eleectric roads on all streets in Oakland between 7th and 16th, except 10th, and one has been applied for on tbat street. The residents, however, object, as it is very narrow and the only street for driving between those named. The 16th St. road is running and that on 14th will be this month.

WORD has been received at the Mare Island Navy Yard to commence making the necessary repairs to the Thetis. She will he fitted with a new propeller and of a style tbat is expected to develop considerable speed. When ready for sea, she will go down the coast as far as lower California to complete unfinished surveys of the coast.

THE shipments from San Diego to Mazatlan are increasing. The last steamer took down the largest consignment yet made, consisting of fruits, cheese, pickles, canned goods, potatoes and vegetables. The fruits embrace peacbes, apricots, apples and other fruits produced in the vicinity. The returning cargo will consist of tropical fruits for the San Diego market.

THE San Luis and San Joaquin Railroad Company has been incorporated with a capital stock of $1,000,000 to construct a railroad northward from San Luis Obispo to El Moro, a distance of about 10 miles. There is a good bay at El Moro, but its entrance is obstructed by a rock, whicb could be removed without any very great expense. Vessels of deep draught cannot now enter tbe bay, though coasting schooners do so.

AFTER 158 ballots in the San Jose Common Council, plans were adopted for the new Central school building, for the erection of which it is proposed to issue bonds in the sum of $150,000, of which $50,000 are for sewer purposes. The plans of Fred T. Peterson were adopted. The building from his estimate will cost $75,000. There were nine competitors for the prize.

IT is probable that there will be a consolidation of the interests of the Giant Powder and Safety Nitro Powder Companies before long, in which case a very powerful high-explosive manufacturing company would result.

OUT of 108 ships lying in San Francisco hay disengaged, 78 are English. Of the 120,000 tons of shipping here, nearly 40,000 tons are in ships which have recently arrived and are not yet ready to take freight. There are quite a number of big ships at Martinez and other places lying idle waiting for wheat.

VACAVILLE, Solano county, is very active. The fruit crop in the valley is the best ever known, and already this season over $1,000,000 has been paid to the fruit growers for orchard products, and it might be said the season has but commenced. A corporation has just been organized for the purpose of erecting a fine hotel in the town. It will be three and a half stories in height, with all modern improvements.

THE Portland (Or.) Water Commission has definitely decided to lay pipe to Bull Run of a size to furnish a supply of 22,500,000 gallons a day, equivalent to 150 gallons each day for a population of 150,000. The superintendent was directed to prepare specifications to be all completed by December. Bids will be taken so that work on the line can be hegun in the spring. The line will be 30 miles long and water will be supplied from a lake on the spur of the Cascades watershed, about which a tract comprising 300 square miles of forest land has lately been set aside as a Government reservation by President Harrison. There is a chance for pipe manufacturers to get quite an extensive contract.

THE work of closing the gap on the coast line railroad of the S. P. Co. between Santa Margarita and San Luis Obispo is being pushed rapidly. A large gang of workmen is at present building stone culverts on the extension, and they are getting ready to commence tunelling the mnuntains. When the line is completed, overland trains will be put on to run between San Francisco and New York. The southern overland trains will no longer have to come over the Tehachapai and valley route. San Jose will then be on an overland line. Some very extensive tunnel work is to be done on the new line this side of Santa Barbara.

THE San Diego Electric Railroad Co. has several hundred men at work on the different branches of labor, changing the street railway system to an electric system. An electric power house and car shops are being constructed at the foot of E street; double tracks have been laid from the water front on H and Sixteenth streets and Logan aveoue for a distance of four miles, and on Fifth street from the water front to University avenue, a distance of three miles. Trolley wires are being strung, and it is expected that the system will be able to start on tbe 1st of September. Several cars for the new road have arrived, and others are on the way.

MOUNTAIN VIEW, Santa Clara Co., is to bave extensive brick works organized. The Whartenby ranch, consisting of 200 acres of land, has been purchased by M. Salomon & Co. of San Francisco, who, in conjunction with T. Peterson and E. Kartschoke of San Jose, propose establishing the largest and most complete brickyards and starch factories on the Pacific Coast. Mr. Kartscboke bas just returned from an extensive trip through the East and Europe, during which visit he thoroughly examined the most approved machinery for brick and starch manufacture. The clay found on the proposed site is pronounced by experts to be of tbe most superior kind and practically inexhaustible. Electric power will he used in the works, and an electric railroad will be built to navigable water on the bay, which is only three miles distant. From this point the output will he carried to San Francisco and other points by steamer.

THE prospect that a San Francisco contractor will obtain the contract from the United States Government for the construction of the large dry dock at Port Orchard, on Puget Sound, is becoming brighter every day. The two local bidders on the work are J. P. M. Phillips and tbe San Francisco Bridge Company. It is understood that the Department of Yards and Docks at Washington has considered Phillips' bid favorably, although two Eastern hidders have submitted lower bids. Mr. Phillips' bid is $520,000 for the entire work. The dock will be the largest on the Pacific coast, and 200 men will be employed for three years in its construction. Over 3,000,000 feet of lumber will be used and 11,000 piles will be sunk. The cost of the granite to be used will be over $100,000, and the construction of the caisson and pump will cost over $118,000. Over 600,000 brick and 264 000 feet of concrete will he nsed, and 116,000 yards of grading will be done. The dock will have a depth of 46 feet, and will be 110 feet wide and 565 feet long.

OF the 4500 members of the Mechanics' Institute, only 1451 responded to tbe trustees' invitation to express a preference as to whether the present building on Post street should he remodeled or a new library building erected on a portion of the Mechanics' Pavilion lot or in the locality bounded by Powell, Post and Market streets. Of tbe 1451 responses received to this question, 760 favored the former plan, 278 supported tbe idea of a new building on the Pavilion ground, 398 advocated the purchase of a lot between the district outlined, and 25 offered as many different suggestions not called for hy the circular of invitation. If the trustees pursue the plan favored by the majority, they will overhaul the building on Post street, put in it all modern improvements and utilize the entire structure for library and institute purposes. This plan would give the institute sufficient accommodations until the growth of the city makes it expedient and desirable to build on the Pavilion lot at Larkin and Hayes streets.

Personals.

CHARLES SLADE is superintendent of the Golden Gate Mining Co., Sparta, Oregon.

C. E. CHAMPIE is about to put up a 5-stamp mill for his 13 claims in Humbug district, A. T.

GENERAL R. P. KEATING and Frank Golden have been inspecting the Pine Nut mines, Nev.

G. F. DEETKIN, the well-known mining engineer, has purchased the Salsig mine, Placer county.

ALEXANDER and Hiram Tickel are in Fresno, and are about to prospect for natural gas and artesian water.

THE R C. mill near Brownsville, Butte Co., is in charge of E. W. Slater, and J. C. Campbell is superintendent of the mine.

DANIEL E. SAUNDERS is superintendent of the Reward mine four miles from Vekol, Pinal Co., A. T. The mine is owned by a Boston company.

SAMUEL L. JONES, the Comstock superintendent, has been East for a month, hut is expected back shortly. Senator Jones is also expected soon.

U. S. CIRCUIT COURT JUDGE MCKENNA intends shortly making a personal inspection of the North Bloomfield mine before rendering a decision in the case before him.

BUGARD WILKESON is the recorder of the new Bridge Creek district, Washington, including the camps of Bridge creek, Park creek, Horseshoe basin, Little lake and North Fork Bridge creek.

J. W. ROBERTS and G. A. Fredickar have been visiting the Rose mine in Mornngo district, San Bernardino Co. D. A. Wheeler is superintendent of the mine and W. B. Taylor, assayer and millman.

L. P. W. QUIMBY and A. Alger of Portland, stockholders of the Grant Silver Mining Co., have been visiting the mines of Greenhorn, Oregon, and are pleased with the showing made on the properties.

HENRY ARMITAGE of Denver, who recently returned from Johannesburg, South Africa, is in Arizona, where he is superintending the placing of a new 100-horse power Corliss engine and 20-stamp mill on the Hillside property.

DR. F. R. WAGGONER has been making a practical test of ocean-beach mining on Monterey bay, using the Ball-Norton electro-magnetic separator. He is president of the Pajaro Mining Co. which is operating in ocean-beach sands.

EDWARD RIGNEY is at Mokelumne Hill, Calaveras Co., making the necessary preparations to commence work on a blue gravel claim near the Junction on Chili gulch. The necessary machinery is heing procured. The Encino Blue Gravel Co. is an Oakland corporation owning the mine.

W. B. THORP of the Newcastle *News*, Newcastle, Placer county, has received the Republican nomination for State Senator in the 5th senatorial district, which includes Placer and El Dorado counties. Although from a fruit-producing region, Mr. Thorp is a friend to the mining industry and is an able young man.

THOMAS B. EVERETT, secretary of the Placer County Miners' Association, made a call at our editorial rooms this week. Mr. Everett is the man who suggested the calling of the State Miners' Convention and tbe organization of miners' associations. At the recent Republican Convention in the 13th Assembly district, he received the nomination for the Assembly from Placer county.

JAMES MARTIN has raised another excitement in Cook's Peak district, N. M., by uncovering one of the richest ore bodies yet found in the camp. Mr Martin is one of the best miners in New Mexico, and has made several rich discoveries for others in both Grant and Sierra counties, as well as elsewhere. His prospects are good now to make a "stake" for himself and the owners of the property.

ARCHIE MCNABB has gone to Lundy to try and get a 5-stamp mill to put up at the Green Creek claims. A number of claims have been located along the supposed course of the ledge, north and south, upon some of which work is being done. The most southerly location extends to the base of Castle peak, where very rich float has frequently been found. It has long been a pet theory witb old timers that Mono diggings were fed by an overflow from some point in this vicinity.

J. H. HEDGES, treasurer of the Utah-Gold and Silver Extraction Co. is in Esmeralda Co., Nev., where he has contracted for 6000 tons of gold tailings from the Pine Grove mine. He intends to put up a cyanide mill of a capacity of 50 tons per day. The tank will be 100 feet long by 16 feet wide, and will hold 136 tons. The tailings contain about $12 per ton, and the company expects to work it at a net profit of $8 per ton. It expects to complete the run in about five months.

COL. C. C. LANE, superintendent of the Tanama Mill and Mining Co., Lower California, intends removing to San Diego with his family. Col. Lane has had a long and varied experience as a mining superintendent. The first property of which he had charge was the Buel North Star mine, in 1867, and since then he has superintended the Timoke, Plymouth, Indian Queen and Lane & Fuller mines in Nevada, the Hackberry mill and mine and the Howell Smelting company's property in Arizona, the Lane & Kurtz mine and mill in British Columbia, and the Alamo Mill and Mining company's property in Alamo.

MORRIS DUSSELDORF, manager of the Comstock Mining Co., at Park City, Utah, accompanied by A. Hanauer, Jr., one of tbe directors, has been making a thorough examination of that property and making an exhaustive report as to its condition and the best means of working it at the present time. After this report is prepared and submitted, Mr. Dusseldorf will leave for New York to place the stock of the corporation, most of it having been subscribed for. Mr. Dusseldorf says developments will he prosecuted hy means of a shaft, and that sufficient machinery will be put in to go deep and at the same time handle wbat may be encountered.

The Mines of Siskiyou County.

FORT JONES, SISKIYOU COUNTY, CAL., July 22, 1892.

TO THE EDITOR:—The mines of Siskiyou county are steadily moving forward and increasing their yield. We are anxiously awaiting the publication of the annual report by the U. S. Mint so as to verify our claims to the fact that we are the first among the few counties of the State of California which have increased their bullion yield in the year 1891. Our county contains 3,890,000 acres of land, 3,000,000 of which may be said to be mineral lands. Our grand old mountain covered with perpetual snow, now having the sun's warm rays upon it affords the miners ample Shasta water for hydraulicking, and, by a very slight manipulation with lemons from San Bernardino county, we have most delicious Shasta lemonade to quench our thirst this hot weather. The farmers throughout the many beautiful valleys in this county avail themselves of Shasta water for irrigation, and it increases the yield of their land ten fold. We claim more nutriment in our farm products than can be found in any other part of the State. We also claim that we have more ozone to the square inch than can be found anywhere on the Pacific coast.

Our operations in developing the high benches in the mountains have been very successful. In my next I shall endeavor to give you a tabulated statement of the yield and altitude at which placer gold has been taken.

Every mining district in this locality can point to new developments and we are proud to say they are all of a substantial character. On Jackson creek, in the South Fork district near Callaban's ranch, New York and Boston parties have taken up a large tract, and they are piping down a spur of the Salmon mountain with a 15-inch pipe and 15-inch giant. The Etna district adjoining has several new drift and placer mines. The Quartz Valley district adjoins the Etna. Here is located the famous Campbell mine, with its several giants and drifts in full operation. Near by, on Shackelford creek, an Oregon company is piping away with a 15-inch pipe and 11 inch giant. The Salmon River country has several new mines opening this summer. It was only a short time ago that 200 pounds of gold passed through Fort Jones from Sawyer's Bar to the United States mint. This much could be said of Scott Bar, Humbug, Klamath and other districts in Siskiyou county. So if you have not heard from us for some time you can rely upon it that the miners of Siskiyou county are alive and active.

There is a movement on foot to provide and maintain a fully equipped hydraulic outfit to work and exhibit at the World's Columbian Exposition at Chicago next summer. Some enterprising manufacturers in San Francisco have pledged the entire outfit as a donation. This exhibit will not only help our county, but will be a great benefit to all mining counties in the State. Any suggestions relating to this exhibit, from practical hydraulic miners, would be gladly received by the Chairman of the Siskiyou County World's Fair Auxiliary Association at Fort Jones. Yours truly,

PLACER.

The Crawford Mill.

MARYSVILLE, MONTANA, July 28, 1892.

TO THE EDITOR:—My attention has been drawn to statements recently appearing in the daily press of Helena, Montana, and also in *Engineering and Mining Journal* of New York to the effect that the Crawford crushing and amalgamating mill has been operated upon pan tailings from the Montana Company's mill at the Drumlummon mine, and that it effected a saving of 50 per cent from tailings of $1.60 value per ton.

The articles in the daily press make me indorse the machine. I beg to state that the Crawford mill has never been employed at these works, and has never worked any tailings from our pans or mills. I know nothing about the Crawford mill or its operations, and have never seen the machine. The use of my name or that of the Montana Co. is without warrant or permission.

G. H. ROBINSON,
General Manager Montana Co. (Limited).

The Mercury Mines of Almaden.

The following description of the mercury mines of Almaden is taken from the *Journal de la Chambre de Commerce de Constantinople:* The mercury mines of Almaden, in Spain, are a short distance from the town of that name, following the valley in a northerly direction. The veins of the precious metal are disseminated a little haphazard, but those at present in working, form altogether a zone stretching for a length of from 160 to 170 meters, and which is only from 10 to 12 meters wide. The depth of the bed is still unknown, for the reason that when a vein is exhausted, the depth of the well is increased in order to reach a new vein. Between the different workable veins there are beds of ores and rocks of different kinds; the average thickness of the unworkable beds varies between 10 and 37 meters. The deepest gallery at present reaches 317 meters. A curious feature is that the farther the distance gone, the quality of mercury improves and the quantity increases. In the 10th and 11th galleries (the deepest), the mercury runs, so to speak, from the rock as resin exudes from the trees. The rock varies in color and passes from black to brilliant red; the more the color approaches red, the more the quantity of mercury increases.

The pits at present in working, number three. The other old wells have been abandoned, and only serve in exceptional cases. On delivery from the pits, the ore is smelted in vast furnaces, with enormous cupolas, beneath which a fierce fire is constantly kept burning. Distillation is effected through a long and complete series of tubes, formed of thick jars, with a long and narrow neck, fitting into each other. In the lower portion of these jars there exists a kind of small reservoir, where the drops of mercury produced by the evaporation of the metal in a state of fusion are condensed. These drops are then collected, and with the aid of small pipes, stored in large iron barrels. The production of mercury reaches about 55,000 to 60,000 frascos per annum; the frascos are bottles of cast iron, which contain four arrobes of about 25 pounds each. The workmen at present employed number about 2000. There are also a thousand workmen who are employed out of the mines with machinery, furnaces, transports, and other works.

The Gold Belt of the Atlantic Slope.

The gold belt of the Atlantic slope, says the Richmond *Trade-Journal*, is worthy of more attention than this publication has heretofore been able to give it. That the belt is more extensive than the gold fields of California goes without saying, and that in the near future it will show its value to all the world can be assured without question. We are, however, more interested in the Virginia part of the belt, which may be said to begin at the Potomac river and thence through the State in a southwesterly direction to Halifax county, and instead of its being only 20 miles it will likely be found to be nearer 50 miles wide (as the new discoveries in Floyd and Carroll counties prove). The recognized gold belt in Virginia, according to the work of 40 years ago and down to the present time, takes in Loudoun, Fauquier, Culpepper, Stafford, Orange, Spottsylvania, Louisa, Fluvanna, Goochland, Buckingham, Charlotte and Halifax counties. Probably the richest counties in Virginia are Fluvanna and Goochland, in which is the Hughes mine. Probably the best gold mines on this end of the belt is the one 5½ miles from Bremo Bluff—the Long Island mine, near the Rivanna river, one mile from Wilmington (which was worked with great success in 1854 by Commodore Stockton); the old Tellurium mine (also at one time worked by Com. Stockton); the Busbys and Collins and Moss mines, each of which were favorably reported upon by eminent experts as long ago as 1844. Then comes the Tagus mine, four miles from Columbia, Va., which also has a fine new mill capable of milling 20 tons a day. Extensive development work is being done in this section, notably on the Bowles mine of 800 acres, owned by Philadelphia men and which is in charge of Mr. Russell Willard, a very bright young man, who has had the advantage of three years' experience on an extensive silver mine in Old Mexico. Then good work is being done by old Colorado mine, on the Mass mine (which joins the Bushy), where a shaft is being sunk to 500 feet depth and is very rich ore (the ore in this camp is considered the richest average in this part of the Virginia belt, being worth, at 95 feet depth, $40 a ton). The values in this section are principally in the veins, all of which, so far as known, are true fissure veins, yielding from $10 to $200 a ton. There is one mine in this group, however, which is both a vein and placer property; this is the Callus mine, which, it is claimed, is one of the best, if not the very best, of the placer properties in Virginia.

In this camp there seems to be a determination to get in shape to take out the values in a regular, legitimate business way. Gold mining has ceased to be a doubtful business, for under the improved processes and with modern machinery, results are certain and sure. Gold mining now is attended with no more risk than cotton spinning or coal, iron, zinc or lead mining. This could not have been truthfully said some years ago. What is being done daily on this belt proves beyond any question that gold mining is as sure as any business in which capital can engage. The errors of the past are the safety of the future.

Northeasterly, the belt extends into Montgomery county, Md., where Senator Sawyer owns a fine gold property for which he has refused $250,000. This property was developed by Dr. Kemester (lately Commissioner of Emigration in Europe). Then, near the Sawyer mine, is a very rich property owned by Chicago men. Mr. Russ, one of the owners in charge, took out in one week, during his drifting at about 70 feet below the surface from rock here and there, over one pound of gold, worth about $225. The Virginia gold mines (best in Fluvanna and Goochland counties) are not so rich in free gold as the two in Md. (as above), but the veins are more uniform in width, depth and value. The best authority gives the probable depth of the Central Virginia veins at 2000 feet.

Smelter at Needles.

T. R. Gabel, general superintendent of the A. & P. R. R., passed through Kingman, Tuesday, in his private car, says the Mohave *Miner*. Mr. Gabel was present in Needles while a meeting of the stockholders of the Needles Reduction Co. was being held, and it was at that meeting that it was decided that the plant erected by that company to treat ores by the MacArthur-Forrest or cyanide process was a decided failure. The company made a number of tests on a large scale on ores from different mines in San Bernardino county, California, and Mohave county, Arizona, which demonstrated unmistakably that some radical improvements must be made in the modus operandi of the process before it can possibly be made a success. Having arrived at this conclusion, it was next decided to erect other reduction works at Needles and a thorough and complete knowledge of the character of the ores to be treated and the means and facilities at hand for transportation and reduction, induced the company to arrive at the conclusion that a smelting plant was required. With the energy and enterprise that has characterized all the actions of the company, they immediately proceeded to contract for a $250,000 smelting plant. The A. & P. railroad company will haul coke, coal, limestone and iron, as well as ores, to the smelter at greatly reduced rates, thus enabling the smelting company to bid for the low-grade ores of Mohave county, which until now have been worthless on account of the high price of transportation and reduction. The mines that were capable of producing high-grade ores in paying quantities have been pretty closely worked for the past 20 years, and now what Mohave county needs is a chance to work low-grade ores at a profit. By low-grade ore we mean ore that will run from $25 to $50 per ton. Of such ores, the supply is almost inexhaustible.

The erection of this immense smelting plant at Needles will create a new demand for lead ores, and render the low-grade lead mines of this county that are now lying idle, profitable producers. Prospectors have been sent up the Colorado river in search of lead ore, immense deposits of which are said to exist north of El Dorado canyon on the Nevada side, not far from the river. An agent of the smelting company has been supplied with the necessary funds and empowered to erect a sampling works at the new camp of White Hills, and purchase the ores of that and surrounding camps for shipment to the smelter. It is not yet fully decided whether the ore will be hauled to Kingman and shipped by rail to Needles, or whether it will be hauled directly to the river and from there by boat to the works. While the road from White Hills to the river is only about one-half the distance to Kingman, yet the natural disadvantages of the former route are so great, owing to heavy grades and sandy roads, that it seems more than likely that the route by way of Kingman will be far more practicable and cheaper. The price now charged for hauling ore from the new camp to Kingman is $30 per ton, and teams are always loaded both ways. This is far in excess of what the hauling can be done for to a profit. It will only be a short time after teams sufficient for the demands of the camp come in, until ore will be hauled for less than half that sum. Transportation by means of the little flat-bottomed steamers that ply the Colorado, is scarcely less expensive than hauling on wagons. Mr. Gabel expressed himself as favoring the route via Kingman.

Asphalt in the Trades.

From the beginning of the rubber business, manufacturers have appreciated the use of asphalt and tar in a variety of rubber compounds. Especially has this been true in goods cured in what is known as the dry heat. Boots and shoes, clothing and insulated wire compounds to-day all have a certain percentage of what is known as tar, but which is usually purified asphalt. The common belief that the goods are injured by the addition of this substance is wholly erroneous; a certain amount of asphalt compounded with rubber assists in calendering, and during vulcanization imparts a certain toughness to the rubber which is not to be gained in any other way. The proportion used to-day is but small. For example, what would be known as a rich compound is 18 pounds coarse Para, 11 pounds litharge, 40 pounds whiting, 3 pounds asphalt, ½ pound lampblack, 11½ ounces of sulphur. Exactly what asphalt is, very few people seem to know, and it is almost invariably in the popular mind confused with coal tar. Asphalt as a paving material has been known since the Babylonian empire, and to-day paving blocks are found that preserve their integrity, and have hardly begun to oxidize in spite of the atmospheric changes to which they have been exposed. It is only within late years that asphalt has been well known in the United States. It looks very much like pitch, and when ignited burns with a bright flame, giving off a dense black smoke. Alcohol, ether, oil of turpentine, naphtha, and many other reagents, easily dissolve it. Its specific gravity is 2.23.

Until very recently all the real asphalt used in this country was imported. There is in the island of Trinidad a lake nearly two miles in circumference, which is the source of the most of it, and it is said that near the shore the asphalt is very hard, but out in the center it is soft and viscid. When imported to the United States, it comes mixed with sand and gravel and a variety of foreign materials, from which it is separated by heating over a slow fire for a week or more. During this heating process, the impurities of a lighter nature rise to the top and are skimmed off, while the heavier substances settle to the bottom of the receptacle. There are very large deposits of asphalt in France and Switzerland, and within the last three years quite extensive deposits have been discovered in Utah and California, and some small ones in Kentucky. For paving streets, it is prepared by grinding first to a powder and mixed with crude petroleum and fine sand. It is then molded into blocks of suitable size, or sometimes it is poured between blocks of paving stones, when it becomes hard and greatly resembles the natural rock.

Another use for asphalt is in the manufacture of black varnish, where it is dissolved in oil of turpentine and linseed oil, and makes an exceedingly durable coating. For insulating electric wires, this sort of coating has been found of great use, and it is said that one of the best rubbers for wires to-day manufactured is made of a fine compound containing 30 per cent of India rubber, the compound, after semivulcanization, being dipped in boiling asphalt, which toughens it exceedingly. As asphalt is not affected by acids or gases, and is an absolutely waterproof compound, and as heat and cold do not affect it, it is a valuable article to use in connection with India rubber, although if too large quantities of it are put in, it shortens the gum, and may, during the process of vulcanization, cause it to blister. A great deal of the gum roofing sold in the United States, which is thought to be India rubber or gutta percha, is made simply from a solution of asphalt spread upon prepared paper.—The India Rubber World.

THE Board of Supervisors of Santa Clara county has granted the petition for a franchise for an electric railway from the Southern Pacific depot through the town of Mayfield and College Terrace to the grounds of the Leland Stanford Jr. University. It is intended also to build a short electric road from Palo Alto station to the university, but this latter road will run mainly through Senator Stanford's private grounds.

At the World's Fair.

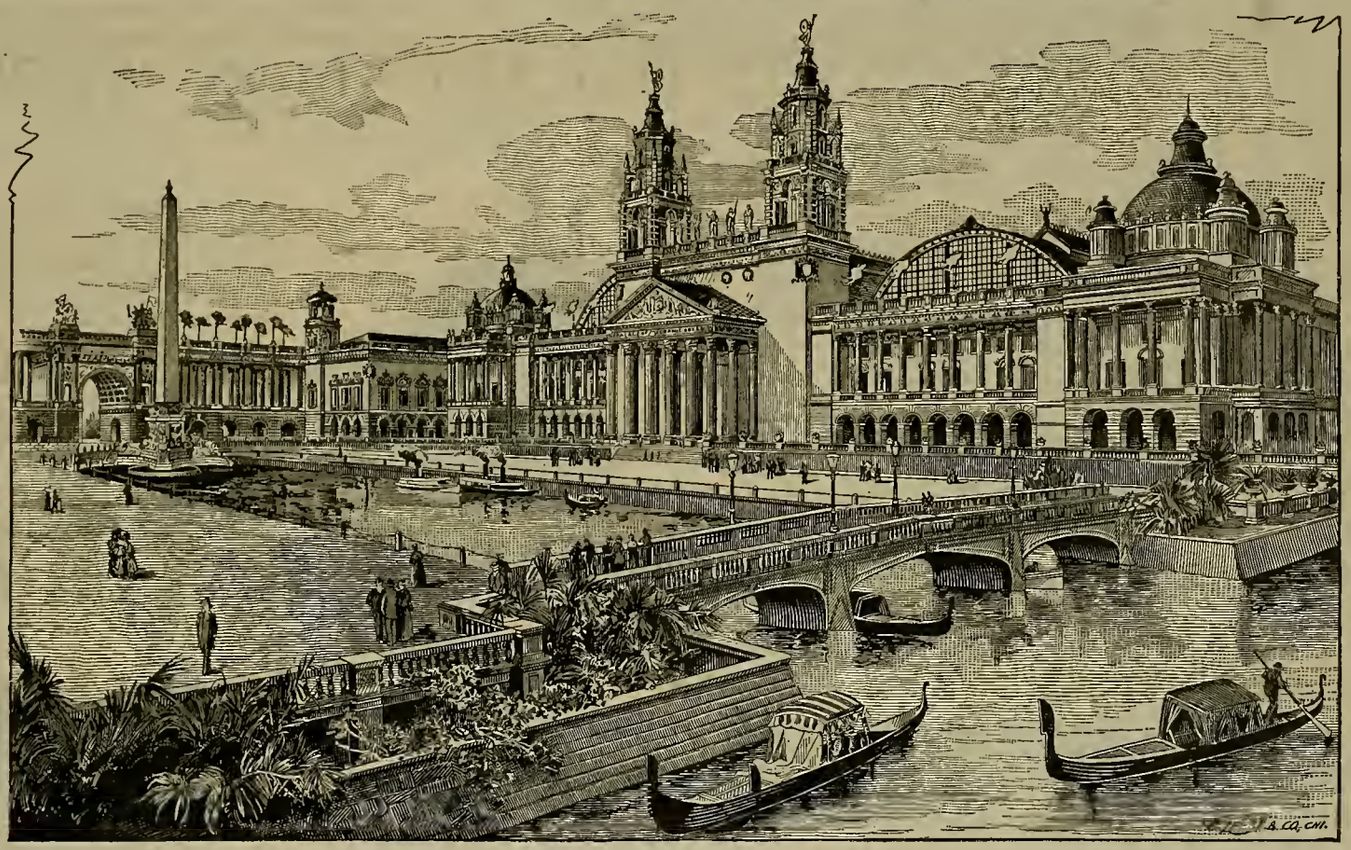
As the time draws nearer to the opening of the great Columbian Exposition at Chicago interest becomes keener in everything pertaining thereto. We have no doubt our friends who are serving upon county commissions and local committees, in solicitation and preparation of exhibits, are continually impressed with the fact that they have much to do in a short time. Those who anticipate a visit to Chicago and the East next summer, after long years of absence, feel their anticipations becoming ruling thoughts. With so much interest to cater to, we cannot probably do better than to present occasional glimpses of the great affair of the future as space permits.

The engraving on this page shows a perspective of the Machinery Hall, or, as its formal name runs, the "Palace of Mechanic Arts," which is now approaching completion at Chicago. The beauty of the building and its environment are striking. This building will be 850x500 feet and cost $450,000. It is located at the extreme south end of the park, midway between the shore of Lake Michigan and the west line of the park.

The building is spanned with three arched trusses, and the interior will present the appearance of three railroad train-houses side by side, surrounded on all the four exterior sides by a 50-foot gallery. In each of these long naves there is to be an elevated traveling crane for mining machinery. Steam power for this building will be shipped from a power-house adjoining.

The two exterior sides adjoining the grand court are to be rich and palatial in appearance. The two facades of Machinery Hall on the court are rich with colonnades and other features.

The design follows classical models throughout, the details being followed from the renaissance of Seville and other Spanish towns, as being appropriate to a Columbian exposition. An arcade on the first story admits passage around the building under cover. A colonnade with a cape at either end forms the length between Machinery and Agricultural halls.



PALACE OF MECHANIC ARTS AT THE WORLDS' COLUMBIAN EXHIBITION.

J. W. STEENS ZYNEN, Inspector for the Board of Horticultural Commissioners of Merced county, and interested in the noted Hollander colony of Merced, states that there are about 60 of the colonists in all, and they are raising olives, almonds, oranges, peaches, prunes, chestnuts and many other things. They got their trees and vines started about a year and a half ago, and next year they will begin to hear a little. About 2000 acres are now planted. The Hollanders got their land of the Crocker-Huffman Company, and it cost a pretty stiff figure—$165 an acre—but this included all the water at any time necessary, and, moreover, the ground was smoothed free of the many small natural humps and holes in it. All of this 2000 acres now looks like a garden. It has been a little slow redeeming the desert and all outgo and no income since the colonists took hold. They are looking forward hopefully, however, when they will draw dividends. There are not many women in the colony, and the few there, are from Holland. Most of the colonists are bachelors.

San Bernardino county is contemplating the making of a native salt palace for the World's Fair, using blocks of crystallized salt that measure 12x24 inches, and are perfectly transparent.

The Gold-Mining Industry of Bolivia.

Concerning the gold deposits of Bolivia but little is known, except that ranking third in the world in the production of silver it is presumably rich in gold.

No reliable data can be obtained upon the matter, there being no Government bureau of statistics, and as the metal is not dutiable, there are practically no satisfactory means of ascertaining the annual production of the mines whatever.

The whole matter must be figured from that which passes through the Customhouse of La Paz, in connection with dutiable articles, as merchandise shipped under the sanction of the Government for its greater security in transportation, which is the commonly accepted estimate. Assuming that one-fourth of the annual production passes through the Customhouse, and that the amount so passing for 1890, as shown by the chief officer of the house, was valued at 27,540 bolivianos, we have the total production valued at 100,160 bolivianos, or in United States Currency, $67,582. The quantity produced was 101 kilograms.

Even this ridiculously low figure shows an increase of $7782 over the amount reported for 1888 and 1889. But these figures are all out of proportion to the reputed richness and extent of the gold-bearing quartz veins and gravel beds of Bolivia, and the causes of this limited production and the evidences of the actual existence of these rich deposits can only be learned by tracing the history and explaining the present condition of gold-mining in the country.

When Bolivia and Peru were under the Imperial Government of the Incas, previous to the Spanish conquest in 1532, gold was regarded as a sacred metal, and was used almost exclusively by the former race in the adornment of their royal palaces, temples and the sacred vestments of the royal household. Not entering, therefore, into the circulating medium of the empire, which had neither commerce nor money, and unconscious of its intrinsic value, the Incas sought gold, not for gain, but out of loyalty to their rulers and unswerving devotion to their chief diety, the sun, to whose worship the gold was mainly consecrated.

Traditions of the Quichua and Aymara Indians, and the oldest obtainable records, dating back to the opening of the 16th century, as well as recent explorations, all agree that the northwest provinces of Bolivia, especially that of Larecaja, are rich in gold deposits; that, while the Incas secured considerable quantities of this metal from the Province of Carabaya, Peru, the northwest provinces of Bolivia were the principal whence came the gold that excited the cupidity of the Spaniards.

Long before the coming of the Spaniards, regular quarterly contributions of gold were made to Chiquitos, Peru, where was located one of the receipt boxes of the empire. The gold was transported in 12 llama bladders, holding from four to five pounds of metal each, and the expedition was made upon the full moon day of each quarter. These bladders, technically termed "rosques" by the Indians, are still utilized in the transportation of gold.

The Incas gathered their gold almost exclusively from the deposits of the mountain streams or from shallow excavations made in the rugged acclivities of the Cordilleras, as is demonstrated by traces of their works and rude mining tools of wood and stone which yet remain. Not understanding the virtues of quicksilver, a mineral not rare in their empire, and being deficient in the art of extracting this metal from the quartz, their most advanced method of smelting consisted of small cone-shaped furnaces built at elevated points where they might be fanned by the mountain breezes. Consequently, they practically but skimmed the surface off of the vast gold deposits of the country, but notwithstanding these primitve appliances, history shows no parallel of such treasures of gold as were found in the royal palaces, edifices and temples of the Incas at the time of the Spanish conquest.

At the time of the Spanish invasion and ultimate victory and destruction of the empire, gold-mining was abandoned by the Incas, and continued so up to the close of the 17th century. This was owing to the latter not being allowed by the Spaniards to decorate their buildings with the precious metals.

But about this time Sorata, the present capital of Larecaja, was founded, and soon became the richest city of Upper Peru, now Bolivia. Soon after this event, the famous gold deposits of the Tipuani river were discovered by an expedition of Spaniards from Chile adventurers. These deposits are located on the eastern slope of the Andes, and from the sands of the river millions of gold had been washed by the Incas before the coming of the Spanish.

In the northwestern portion of Bolivia mining operations now commenced to multiply, and many and vast were the fortunes accumulated owing to the richness of the mines and of the free labor of the Indian slave miners.

An important feature of the mining business at this time was the annual gold sale held at a number of important points in Province Larecaja, and which continues to-day to some extent. The gold dealers from all about are attracted to the trade centers, and the time is given up to trading, making merry and feasting, something like our fall cattle shows.

In 1781 the Indians revolted against their Spanish persecutors, in the section lying between Cuzco, Peru, to Tucuman, Argentine. Sorato was destroyed, the Spanish proprietors and miners were killed, and an end was put to the slavery business. In 1805 work was again resumed in this section. This time a Spaniard led a new expedition into the field, and began operations at a point near Aucota, and for the next 60 years the city paid a net annual profit of from 40 to 60 per cent on capital invested, despite the crude methods employed to carry on the business.

Thus we have an idea of the past condition of things. The principal gold-bearing localities are those belonging to the northern belt of the country, but there are other parts of the country capable of yielding enormous quantities of the metal, as, for instance, the Rio Sinpacha in the southern part of the country, which, like all the other parts, need strong capital and the direction of practical men, aided by suitable machinery and skilled labor, and the result would be most satisfactory.

WARDEN HALE of the San Quentin State Prison has put 25 convicts at work building a road from Green Brae to Tiburon across the salt marsh. The property owners in the vicinity have subscribed a sum sufficient to pay for the necessary tools, the transportation of the convicts and the wages of the guards sent to oversee the prisoners. The new road is to be graded to a height above tide levels, and will be macadamized and made fit to stand heavy teaming.

AT the annual meeting of the stockholders of the Benton Con. Mining Co., the following officers were elected for the ensuing year: John T. Hill, president; E. M. Morgan, vice-president; and Edward Howard, E. Hestus and V. B. Allen, directors. V. B. Allen was reelected Secretary and his statement showed a credit of $44,811.69.

MECHANICAL PROGRESS.

Measuring Steam Consumption for Engines.

There are various ways of testing engines and boilers says the Chicago *Journal of Commerce*, according as the engineer wishes to get absolutely perfect results or, at least, as close as he possibly can, or whether he wants to get an approximation and would be satisfied with only a moderately accurate estimate. A test of the economy of an engine is always on the basis of the number of pounds weight of steam that the engine will use, or, what is equivalent, the number of pounds of water required by the engine per horse power. One method of finding this is from the indicator card. We take a card, and, as it gives the pressure of the steam at all portions of the stroke, we can take any part of the stroke and figure what volume is occupied by steam, how many cubic feet of space in that cylinder the steam fills at the point in the stroke, and looking at the indicator card, we see the pressure of the steam at that point. That is all that is necessary, for, turning to a table, we find that at that pressure a cubic foot of steam would weigh so many pounds, and, knowing how many cubic feet of steam there are, multiplication does the rest. This is for one stroke, but it is easy enough to multiply by the number of strokes per hour to find the water or steam consumption per hour. Not all of the steam is exhausted, however. Some of it stays in the cylinder and is compressed. This must be deducted, but in the same way, finding the volume and pressure at a certain point as before. This method, however, is not very accurate, for the valves or piston may leak, steam is condensed, or there is hot water in the steam, and these things the indicator does not show. They must be estimated and added to the total, as shown by the card. This loss varies with the load and pressure. A usual estimate is to add 25 per cent to what the indicator shows, but this will not do for all loads, for with the early cut offs the percentage of unindicated loss becomes greater. For a quarter cut-off, and a mean effective pressure of 42 pounds, the loss to be added is 25 per cent. For one-fifth cut-off the unindicated loss is 30 per cent; for one-seventh cut-off, 40 per cent; and one-tenth cut-off, 58 per cent. The percentage of loss becomes less with the longer cut-offs, being 21 per cent at three-tenths cut-off, and 13 per cent at one-half cut-off. Those losses must be added to what the indicator shows, and the result will be fairly satisfactory for an engine in fair condition, not leaking badly. Another way of conducting this test is to watch the water-guage glass, mark it, and note how long it takes to lower the water to a certain distance, all the steam being meanwhile used in the engine, from which indicator cards are being taken at intervals. From this test the volume of water used by the engine in a certain time can be figured from known dimensions of the boilers, and divided by the horse power and the time. A comparison of this with the consumption indicated by the indicator would be of interest. The most accurate way would be to weigh all the water that was pumped into the boiler and deduct that carried over as moisture, and charge it to the engine. The only proper way to do this is to have tanks, feed into tanks, weigh the water and pump the water into the boiler, keeping account of the water weighed, and leaving the water the same height at the end of the test that it was before. Cards taken meanwhile would show the horse power, and from these two factors the water per horse power is easily found. A fair approximation can be found by making careful tests of how much water each stroke of the pump will take, averaging these, and putting on a counter to count the strokes. Knowing how many pounds of water the pump will force at a stroke, it would be quite simple to find the total pounds pumped for a certain number of strokes.

COAL THROUGH A PIPE LINE.—The H. C. Frick Coke Company recently made a test of transporting coal by means of pipe lines. The coal was ground to a powder at the Standard crusher and transported from there to the Valley works. It was then mixed with an equal amount of water and pumped through a two-inch pipe a distance of 1300 feet to a tank at an elevation of 40 feet. From there the coal dust was charged into an oven and the test made. The experiments are said to have shown that coal can be transported in liquid form, but whether it can be done profitably or not remains to be seen. Mr. H. C. Frick expresses the opinion that this means of transporting coal is practical and will in time be used. There are one or two things yet to be overcome. The trouble is that whenever the pumps are stopped, the crushed coal will clog in the pipes and serious trouble will follow. Something will sometimes happen to the pumps or the machinery, and the mixture being forced through the pipes, will clog. Another question is the cost. The experiments made show that the cost of transporting coal by means of pipes is greater than the present and ordinary way. This may be remedied as was the transportation of oil through pipes, which a few years ago was not thought possible or practicable. American Manufacturer.

Automatic Machinery.

There seems to be a craze for automatic machinery at this time. Some of the enterprises remind me of the old farmer who invented and patented a torch, which was lighted at the open fireplace, and then used to light the candle. No one but the inventor could see why this was better than to light the candle directly at the fire. People seem to get into "automatic" ruts. It does not necessarily follow that because work is done on an automatic machine, that the net work is less than by some other method. This idea is hard for many people to understand, as it is quite natural to assume, on general principles, that the automatic work is always cheapest. There seems to be more men at present competent to design nicely working automatic machinery than to use good judgment in deciding when it is and when it is not well for automatic machinery to be used. It is quite possible for this class of machinery to be just what is needed for a certain shop, and the worst possible thing for another shop, even on the same kind of work.

In the manufacture of milled machine screws, it has been pretty well demonstrated that it does not pay to slot the screws automatically, or, more particularly, not to slot them on the same machine that turns them and cuts the thread. In the first case, a boy can slot a thousand screws in a day on a simple fixture costing not over $10; secondly, the interest on the difference between the cost of a plain automatic machine to turn (mill) and thread screws, and a complicated one to slot them also, will nearly, if not quite, in itself, pay for the hand work work of slotting, to say nothing of the time lost, and the expense made by periodical overhaulings of the complicated machine in the repair shop. Again, the machine that makes and slots the screws is good for screws, while the simple machine may be used to turn almost anything within the limit of its size. Machinery for setting and distributing type is also a good example of this idea; a machine for setting and distributing only, is a comparatively simple one, and can be built at a comparatively low price, but when the little odd jobs of hoy's work are included in the operation of the machine, it seems to many people who are competent to judge, that "it does not pay for the powder." The complication increases in a compound ratio with every additional duty put upon the machine. The fact that a machine will do everything does not in itself make the machine valuable—except, perhaps, to the man who is selling the stock. Complicated machinery for automatically tapping nuts is of the same class, because the cost of the work they are intended to save is so very low in the first place that it is almost impossible to make a saving that will pay the interest on the cost of the machinery.

I remember one concern that bought an automatic machine for making small rings. The machine would make enough in one day to last them a year, but it wouldn't make anything but rings. One-tenth of the cost of the machine would have supplied them with rings for all the time they could possibly be in business, but they never could understand why they didn't get the rings cheap, because the machine made such a large number in a day. Certain dealers in clothing always claim to sell below cost, but make money because they do a large business. In mechanical matters, loss cannot be multiplied by anything that will make it a profit, because mechanics deal with facts. It seems safe to say, in a general way, that, in the present state of the art, a complicated and expensive automatic machine, to perform a simple and cheap operation, is not a good investment.—W. L. Cheeney in the Engineer.

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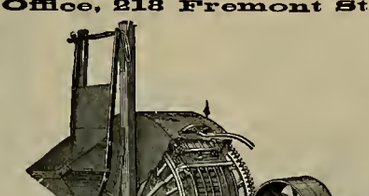

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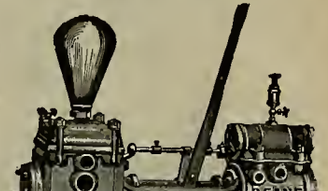

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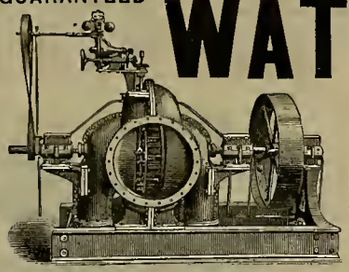

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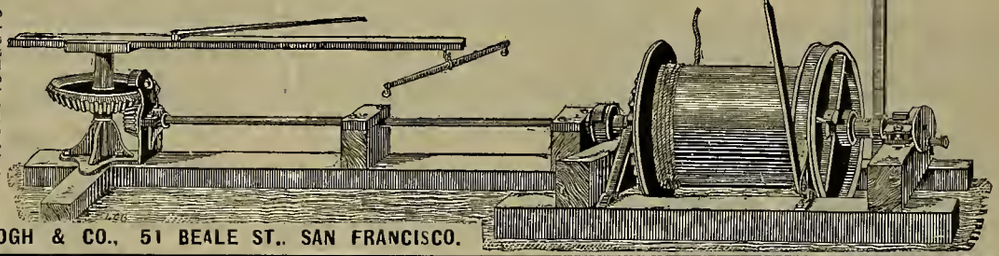

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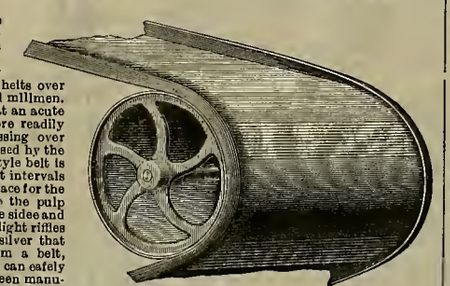

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SCIENTIFIC PROGRESS.

Golden Trout.

Three specimens of trout caught in Mount Whitney creek, on Mount Whitney, by Mr. Harvey of Lone Pine, Inyo couoty, Cal., and by him given to Hon. Geo. S. Mills, Fish Commissioner of Nevada, who in turn sent them to William H. Sharkley, were sent to Dr. David S. Jordan, President of Leland Stanford Jr. University, with the request that he classify them. Tbe following is what Mr. Jordan has to say of tbem:

"They are the famous golden trout of Mt. Wbitney aod the Upper Kern river, which has attracted the attention of anglers for some little time, but which has not yet, so far as I know, received any adequate notice in print.

"The trout were first brought to my notice hy Lieutenant Wheeler's geological survey, which brought me specimens in 1877. Tbese were not in very good conditioo. I regarded them as of the same kind as the the trout in the headwaters of the Colorado, at the same time calling attention to the remarkable distribution of species on both sides of the desert and the mountaios. Later on I received other small specimens, hut still in such poor condition that I could do nothing more with them. The three received were in perfect condition, and I have had a colored painting made of them. The fish is really a distinct species of trout, entirely different from any found elsewhere either in the Rocky mountains or Sierra Nevadas. The very small size of its scales, the lack of teetb on the hyoid hones, and the peculiar color markings, are all distinctive of this trout, which will in time receive a name of its own.

"It seems evident, so far as one can judge of such matters, that this trout is descended from tbe trout of Western Colorado, which abound in the trihutaries of Clear river, the Green river and the Grand river and in the Gunnison district. But in being separated from these trout it has undergone a coosiderable change, and one would think this separation must have occurred hefore the Sierra Nevadas were elevated. It has already been claimed hy geologists that the Kern valley, altbough on the California side of the Sierra, is geologically a part of the Great Basin. Its trout, at any rate, are wholly different from the rainhow trout of California."

Adherent Lead Coating for Steel Plates.

English newspapers report the result of a new process of coating iron and steel plates with lead, wbich promises to have an important bearing upoo industries in which terne plates and galvanized plates are sometimes used. Following is a description of the process: Tbe plates or other articles to be coated are first pickled in bath to remove scale. Through this hath a weak current of electricity is passed, which is said to reduce tbe time required by one-third. From this bath the articles are passed as usual into anotber of lime water, which neutralizes the acid, and thence into a tbird of clear water. They are then immersed in a fourth bath consisting of a neutral solution of zinc and stannic chlorides, obtained hy dissolving granulated zinc and tin in hydrochloric acid. From this bath they are passed into a drying chamber heated by steam, where the moisture on them from tbe last bath is evaporated, leaving behind a deposit of the mixed metallic chlorides, which protects the plates, etc., from oxidation. When dried, these plates are ready to be passed into a bath of molten lead.

On issuing from the batb, tbe plates are found to be coated witb a uniform and very adherent layer of lead. Though perfectly uniform, this layer is nevertheless very thin. The ductility and strength of the iron are not decreased by the process, and a plate can be bent aod closed, and again opened out, without breaking the coatiog. In the case of galvanized iron, hending the plate to a sharp angle causes the coating to crack. At the works there are shown specimens of water pipes coated completely inside and out with lead. One of the pipes was a riveted steel pipe about nine ioches in diameter. For such purposes tbe process seems peculiarly advantageous, as it not only preserves tbe metal, but allows calking to be entirely dispensed with. Samples of sbip plates have also heen coated and the riveting afterward done in the usual way without breakiog the coating, which we may also remark, takes paint very well. The thinness of the coat is remarkable, as two ounces per square foot of plate proves sufficient, whereas tbree ounces of spelter are in general required in galvanizing. The inventors claim that an additional economy will he effected by the fact that there is no precipitate or sediment deposit in their melting tanks, as occurs with zinc, while at the same time the molten lead has no effect on the material of which the bath is constructed, which may, therefore, last indefinitely.

REFRIGERATION BY CARBONIC ANHYDRIDE.—Refrigeration hy means of cold air appears likely to be superseded hy a system of refrigeration by carbonic anhydride, which a reporter of London *Iron* recently witnessed in operation at Messrs. J. & E. Hall's works at Dartford. This system was first hrought out in Germany, where its success led to Messrs. Hall introducing it into this country. The apparatus, which is very compact and small for its refrigerating power, consists of an evaporator, or coils within which the liquefied carhonic acid is caused to evaporate. It is then drawn into a compressor and raised to the liquefaction pressure; it then condenses into a liquid within the coils of a condenser, whence it flows into the evaporator, and so on in a closed cycle. Liquefied carhonic anhydride evaporates under atmospheric pressure at about 120° Fahr., helow zero. In the machine, however, it is evaporated at 0° Fahr. or—10° Fahr., according to the temperature it is required to produce, cooling the hrine surrounding the evaporator-coils to within a few degrees of itself. Tbe hrine thus cooled circulates in the freezing-rooms, chill-rooms, cold stores, or between the ice-moulds in ice-factories, and abstracts the heat from the water or goods to he frozen or chilled. These machines are said to effect the same work as the dry air refrigerator, on one-seventh the coal consumption, and with one-fifth the weight of macbinery. The system is without danger. Carhonic acid gas is used for making soda-water; it is inodorous and nonpoisonous, and the entire contents of a machine might be allowed to escape without causing inconvenience. The machine we inspected is capable of producing 24 tons of ice in 24 bours, or, if used for cooling, it is equivalent to the meltiog of 48 tons of ice io that time. It has been made to the order of Messrs. Nelson Brothers for their largest sheep-freezing establishment in New Zealand, at wbich they freeze over 2,000 sheep per day, and who ordered it after haviog bad evidence of its great coal economy.

VENETIAN GLASS.—Everyhody admires Venetian glass, the product of the Murano factories, hut few know "how it is done," and even those few do not know the real secret. The curious may stand hefore the furnace and watch the whole process from the time the first lump of glass is put into the white fire at tbe end of a long, hollow iron rod till tbe perfect vase is put into tbe oven to he slowly cooled, hut they will not see below the surface. The development of the vessel is before you. The secret of growth is hidden. Not even the proprietor of the establishment koows it. The mystery is io the keeping of two men, is handed down from generation to generation. The father shares it with his son or with his nearest male kin. The eldest always has one or two young memhers of his family near him as apprentices, who learn from him the process of manufacture and who may he considered "in the line of succession." In order to provide against a mischance the secret is written down and deposited in a lawyer's archives at Venice. When one of these two men dies the otber takes the paper, explains it to tbe nearest male relative and then locks it up again. The Veoetians of the middle ages invented the art and made it famous. During the tumult through which Venice passed the secret was lost, but ahout 70 years ago an Italian gentleman, who had pondered long on the mystery, chanced to hear of an old man who it was said had the secret. It was handed down to him from his father. It had survived in a family of peasants, who guarded it with a jealous care. Tbis old man was induced to try the process, and the result was the revival of Venetian glass. The old villager's family has been enriched, hut the men still remain simple workmen.—Boston Journal of Commerce.

IT is stated tbat the patents of Edison, Graham, Tainter, Bell and Chichester Bell for the phonograph and phonophone, embracing all the known methods of recording speech and other souods, have now been combioed, and that it is probable that in a short time tbis marvel of modern inveotive skill will be available for business purposes. Several of the men who have shown their enterprise hy takiog up the telephone when it was regarded with little else than polite curiosity, are now said to be interesting tbemselves in the introduction of the phonograph in Great Britain.

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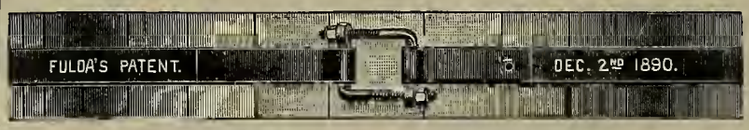

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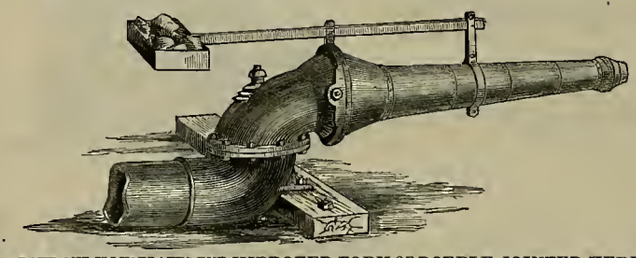

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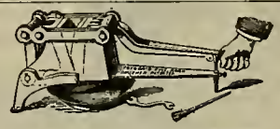

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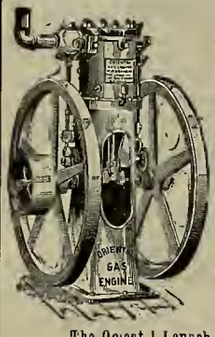

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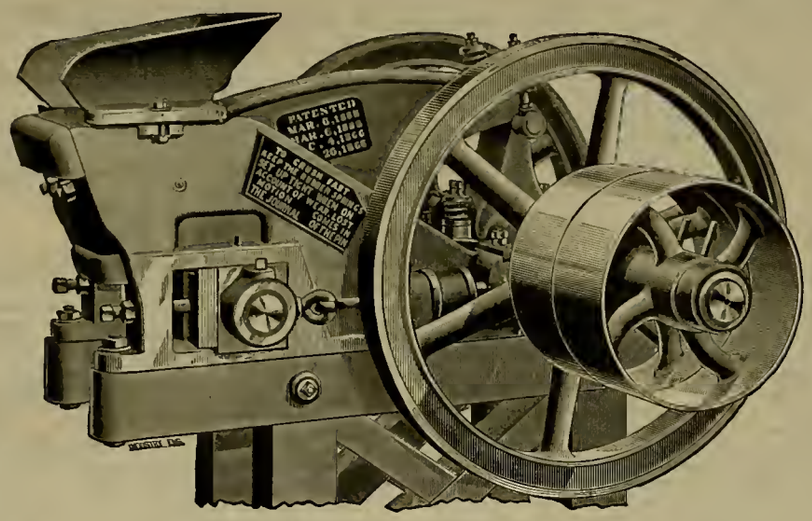

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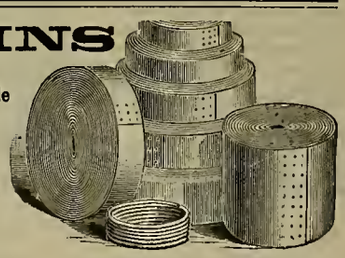

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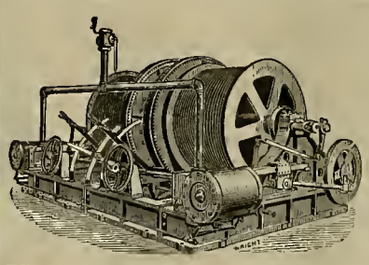

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ELECTRICITY.

Water Power in Switzerland.

The utilization of water power for industrial purposes by means of electricity, an important achievement of the present day, is of extraordinary significance for the industries of Switzerland, a country placed in an unfavorable position, and in consequence of its lack of coal, is called upon to make a more complete use of its abundant water power.

Hitherto a practical outset in this direction has been made only at a few places in Switzerland. An extensive undertaking, which is only in its inital stage, is being made at the falls of the Aar at Wynau, and when completed will be of the greatest importance for an extensive district. Herr Bangerten, of Zangenthal, has studied the question closely, and has given in, to an assembly of parties interested, a thorough going report on the execution of such an undertaking.

Herr Bangerten shows that in Switzerland in the year 1891 there were altogether 2,359 mechanical establishments with a motive power of 54,243 horse power water, 27,432 steam, 394 gas and 332 electricity, or a total of 82,393 horse power, not including the thousands of horse power which do not come under the Factory Act. Two-thirds, therefore, of the power are furnished by water and one-third by steam, for producing which twenty-eight million francs are sent abroad for coal and eight million for petroleum. But according to the calculations of the engineer Lautenburg, of Berne, Switzerland has at its disposal more than 600,000 horse power of water power at present unemployed and easily available.

The territory of the Wynau water power, a concession of which has been granted by the goverments of Berne and Solothurn to Herr Muller-Landsmann, of Lotzwylly, extends for a length of 8,000 metres with a general fall of 9 metres. A weir is to be erected above Wynau, from which a canal 1,000 metres long branches off on the right bank of the Aar, at the lower end of which the turbines will be placed.

From the weir to the turbines there will be a fall of 2.20 metres, which can be increased to 2.70 metres by damming up the water at the sluices. The total average affiux of water is at least 75 cubic metres. The fall and the quantity of water yield, therefore, is at least 2,500 horse power which may be increased to 7,000 by suitable prolongation of the canal. The circle of parties interested, taking Wynau as a central point, has a radius of about 20 kilometres. The yearly cost of horse power will be from 160 to 190 francs. The concessionary, with certain reservations, has sold the whole to the Swiss Compressed Air and Electricity Company. The total outlay for erecting the works and bringing them into action will be from 2 to 2½ million francs. It is calculated that, *e. g.*, the chisel of a stonemason aided by compressed air will preform six times the work of a chisel used by hand alone.—Electrical Review, London.

Train Lighting by Electricity.

It is believed that Prof. J. F. McElroy, Superintendent of the State School for the Blind, at Lansing, Mich., has solved the problem of lighting a train by electricity in a successful and economical manner. The machine devised by him is a cylindrical dynamo, which is attached to the forward axle of the locomotive. No wire is used in the armature or in the part of the machine which conducts electricity to the lighting system after the parts have become sufficiently charged with the current. The armature of the new dynamo is fastened immovably to the axle, and this revolves in contact with the other parts of the dynamo, which rests upon roller bearings at the end of the cylinder. The entire machine does not weigh over 300 pounds, and is completely encased in an iron jacket, so that snow, rain, or dust cannot affect it.

It is said that it will run for weeks without any attention whatever, and all it requires is a little oil occasionally. The wires run under the engine and are connected to each car by means of couplers similar to the steam couplers now in use. The lights are incandescent, and each car can be illuminated to whatever extent is desired. There is a device to retain light in the cars at a standstill. In each car a small but powerful storage battery is placed. While the train is in motion these batteries become charged. When the train stops at a station the power from the dynamo ceases, but automatically the storage batteries come into play and light the train. A car may be cut off and thrown to a side track to await a connection, and the lights will be in service for six hours. The time can be increased at will by increasing the storage battery power. The headlight for the locomotive and every light in the train will be electric, and the tax on the power of the locomotive will be small.

The cost of the new system is less than the ordinary lights now in use on railroads. The dynamo is so arranged that it does not take the power from the locomotive when it is doing the heaviest work—that is, when it is starting. The work begins when the engine is moving at ahout 13 miles an hour. When the train is broken up, the whole apparatus is in a normal condition and requires no attention whatever.—Chicago Journal of Commerce.

USEFUL INFORMATION.

THE ANCIENT BLACKSMITH.—The blacksmith occupied an important position among the craftsmen of the Middle Ages. The insecurity of life and property, which was one of the chief grievances of the times, made strength of material indispensable, whether to guard the shrine of a saint or to protect, after a more homely fashion, the family chest or coffer. The strength and durability of iron led to its use for these defensive purposes from early times. Until coal came into general use, malleable iron was produced direct from the ore with charcoal fuel by continuous working. Sussex was from early times the chief seat of the iron industry. The earliest positive record of the trade there is contained in a grant made by King Henry III to the town of Lewes in 1266, by which the inhabitants were empowered to raise toll for the repair of the town walls after the battle. Every cart load of iron destined for sale, which came from the neighboring "weald," was to pay one penny toll, and every horse load of iron half that sum. In 1290 a sum of money was paid to a certain Master Henry of Lewes for the ironwork to the monument of Henry III in Westminster Abbey, which reminds us that talented smiths were brought often from long distances for important works.—Chambers Journal.

RUST FROM PLOWS.—An exchange gives a good recipe for removing rust from plows. Purchase a small quantity of sulphuric acid, which may be had from any drug store for a small sum. Pour five ounces of it into a pint of water, slowly and carefully so as not to come in contact with the hands or clothing, as it will eat into the flesh worse than fire. Apply this to the plow, or any other iron or steel implement to be cleaned, with a paint brush. As soon as one application of the acid is dry, apply another; usually three or four coats will be enough. Then wash off with clear water. If any spots remain, paint over these spots again and rub with brick dust. After the iron work is cleaned, paint it over with a little coal oil or linseed oil; this will keep it free from rust. Set the implement in a dry place and on a wooden floor. All implements, when kept free from rust and bright, will scour readily in the soil, will do better work, and with little extra force. A badly rusted plow is very worrying to work with, both to the team and plowman. The plow cannot be made to clean, causing frequent stoppages, and the furrow cannot be turned completely over, making very poor work.

VENTILATION.—Gas jets may be made important auxiliaries to ventilation. Inserted in the bottom of air shafts, they establish active currents which withdraw the ventilated air from living rooms. It has been proven by actual experiment that one cubic foot of illuminating gas can be so utilized as to cause the discharge of 1000 cubic feet of air; and as a common gas burner will consume from three to six feet of gas an hour, it will extract 1000 times that amount of air from a room each hour, if suitable contrivances are used, besides giving light. There is a chance for useful inventions based on this principle.

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TO STOP mouse holes, take a piece of common hard soap, stop the hole with it, and you will have no further trouble from that quarter. It is equally as effectual as regards rats, roaches and ants.

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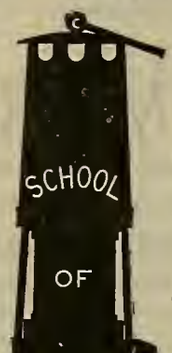

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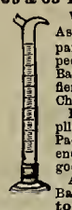
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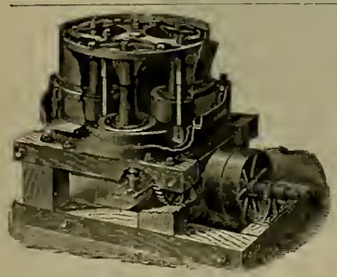

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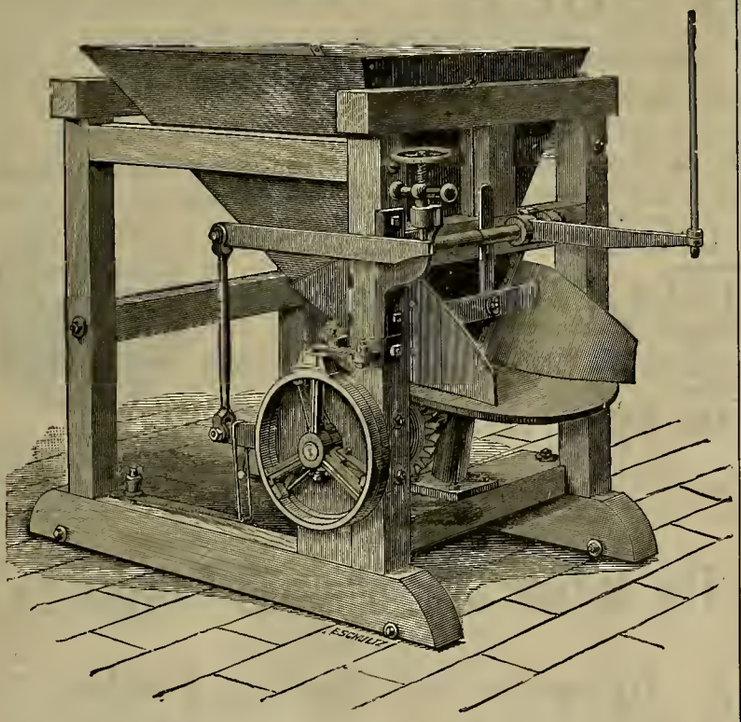

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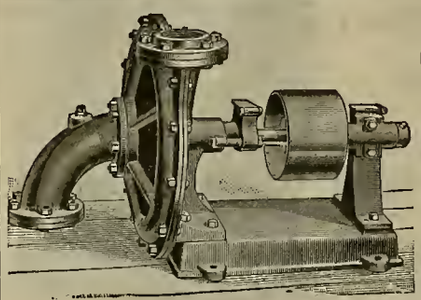

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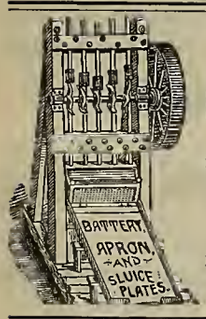

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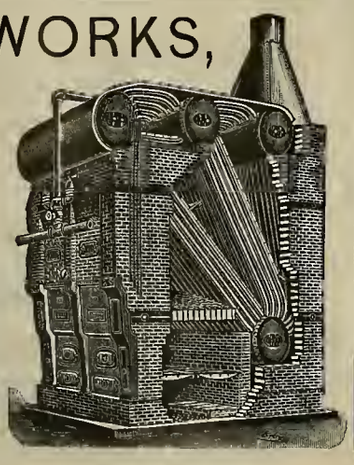

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MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

BAY STATE.—Amador *Ledger*, July 30: The developments during the past week at this mine have again raised tha hopes of the stock holders. After sinking 300 feet, drifts were run east and west in the expectation of tapping the ledge. After running beyond the distance that the ore-body was supposed to be, and encountering nothing of importance, the success of the undertaking looked very dubious. It was next decided to drift north and south along the lode line. In the course of a few feet in the south drift, a small ore-body was struck. It appeared in the shape of a wedge, and in a few feet widened out to twn feet of good-looking pay rock. It carries fine-looking sulphurets, and some pieces show free gold. Samples were left at the Kennedy office last Saturday, which Mr. Parks thought would assay as much as $50 per ton. W. T. Jones, the superintendent, informs us that the ledge has since wideued out to four feet, and that the ore is calculated to mill on an average at least $6 per ton. They have also struck the ledge in the north drift. The shaft appears to have been sunk on a barren spot, or fault in the ledge, and the experience serves to show how easy it is, even under the best management, to miss the ore-body. As a result of these flattering discoveries, the stock has stiffeued in price, and while shares might have been had a couple of weeks ago at a discount, none are offering now at par.

KENNEDY.—Tho new sulphurets works just put up at this mine are completed. They have a capacity of about three tons per day. A frame building is being erected over the ovens, and when this is completed—which will be this week—the ovens will be sufficiently dry for commencement of operations. It is expected to start roasting in a few days.

Butte.

BY AN ELECTRICAL PROCESS.—Oroville *Mercury*, July 28: For some time, negotiations have been pending for the purchase of the old Hewitt placer mine which adjoins Oroville on the east. It was worked formerly by the hydraulic process, but of late years has not been mined at all. It comprises about 100 acres, and is owned, one-third by F. H. Hewitt and two-thirds by Mrs. S. S. Low. Some months ago Samuel G. Hayward, a mining engineer of Denver, Colo., examined the property and became confident that he could mine it profitably by means of an electrical process of which he is the originator. The land was accordingly placed under bond for about $15,000, and he has interested a number of New York capitalists in the scheme. Attorney Sexton informs the Oroville *Mercury* that the deeds have been sent on for confirmation, and the sale will probably be consummated in a few days.

GRAVEL RANGE.—Oroville *Register*, July 28: J. L. Jones of Gravel Range was in town on Tuesday, and from him we picked up a few points connected with the mines of that locality. Gregory, Bracken & Doyle ran a tunnel, but failed to strike pay gravel; and it was thought they would have to run a second tunnel still lower, but by sinking about ten feet at the face of the present tunnel, they struck good gravel that will pay handsomely. Five or six men are employed in running the bedrock tunnel at Linsy Bar, and it will take a month or more to complete that work. It is thought when this is finished that excellent gravel will be found. D. K. Perkins is getting out good quartz from an upraise in his mine, and will soon begin hauling ore to his mill for crushing. Harris & Patterson are not low enough in their tunnel, and will sink to strike the gravel. At Murphy Hill, Mr. Harris has two shifts of men at work sinking for auriferous gravel. John Brandt, in the mine in which he and Messrs. Johnson, Wakefield and Murphy are interested, is in about 200 feet, and from the quantity of water at the face of the tunnel, it is thought that pay gravel will be struck within a few days. Nothing is being done at the Butte King. Half a dozen men are employed at the Good Enough mine, and the gravel is paying well.

QUARTZ.—E. W. Slater, who has charge of the R. C. mill near Brownsville, was in town on Tuesday, and from him we learn that the 20 stamps at that mill are pounding away steadily. The mill is run by a Pelton water wheel, and water is obteined from Dry creek. Sixteen men are kept at work, and arrangements have recently been made for sinking the shaft down 250 feet. It is now down about 100 feet. Plans are being perfected for working tha ore by the cyanide process. This is being very successful at a mill in Shasta county, and J. C. Campbell, the superintendent of the R. C. mine, was up recently to examine the plant and note the effects at the Shasta mill. While speaking of quartz, Mr. Slater informed us that a company had been organized with a capital of $25,000 to open and work the E. W. quartz ledge above Enterprise, and that work had already begun upon the mine. A new tunnel will be run a distance of 140 feet, and this will tap the lode at a depth of 200 feet from the surface. Work on the tunnel will be pushed as vigorously as possible before winter sets in. A good steam power mill is upon the property, so that as soon as the lode is tapped, crushing can be commenced.

Calaveras.

RAOPENING THA COFFAA MILL CLAIM.—Calaveras *Chronicle*, July 30: James and Frank Gleason arrived this week for the purposa of reopening what is known as the Coffee Mill gravel mine, about four miles south of here, near the Junction. A new incline tunnel will be run, work upon which is to commence at once. A steam hoist is to be put up, the machinery for which has arrived at Valley Spring and will be transported without delay.

Colusa.

CHROME IRON MINE.—Willows *Review*, July 30: A new industry has just been developed on the side of the mountain, about 14 miles north of Elk creek and near Newville. Mr. Weil, a capitalist, and Mr. Knight, a mining expert, have a large number of men working on the large chrome deposit discovered several years ago. A road was built to the mine shortly after its discovery, but it was in bad condition, and Wednesday morning 13 men were set to work to rebuild it and we understand 40 miners will commence digging and preparing the chrome for shipment to New York via San Francisco on steamers. The first lot will be shipped about August 15th. The headquarters of the company will be at Elk creek. Teams are now wanted to haul the ore down the mountain and from thence to Fruto, where it will be loaded on cars for San Francisco.

Humboldt.

OIL DEVELOPMENT.—*Western Watchman*, July 30: The boring for oil goes steadily on, both at East Branch and at Mattole. At the latter place everything that is being done in the way of improvement is done in the most thorough manner, indicating the most complete confidence on the part of the company in the success of the venture. At the Garberville or East Branch well they are certainly close to petroleum. Superintendent Gilfillan writes to secretary O'Neal that they are working in soft sand rock, with occasional strata of hard flint or quartz, the latter becoming less and less, and the sand rock becoming more porous, more strongly impregnated with petroleum. We examined some of the drillings at Mr. O'Neal's office, that were brought in by president Pine; they were very strongly impregnated with petroleum. Mr. Gilfillan has had several breaks recently, but has overcome all difficulties, and is in the best possible spirits over the gratifying indications. He stated that the gas is escaping in such quantities and so continuously, that he proposes to confine it and convey it to the engine for fuel purposes. He closes his letter by asking if there is any more stock which he and the men of the creek can take up. At last report the depth was 1290 feet. President Pine showed the drillings he had to superintendent Burrows of the Mattole or Buckeye well, and that gentleman claimed that no better indications could be asked for.

Monterey.

THE PAJARO.—Monterey *Enterprise*, July 30: The machinery in the mill of the Pajaro M. Co. is not, as yet, in running order. Superintendent Waggoner expected to have the mill in operation last week, but a delay was occasioned by the displacement of the dynamo which proved too weak to do the work. It will be about two weeks before the company proceeds to separate the ore.

Nevada.

TO COMMENCE WORK.—Nevada City *Herald*, July 30: The Western Star M. Co. has levied assessment No. 1 of two cents per share, and will commence active operations on its property at once. It will push the tunnel in over 100 feet on the present ledge, which assays $30 per ton. The company feels encouraged over its prospects, and shows the same energy and push which have made the Champion what it is.

GOOD ORE.—Grass Valley *Telegraph*, July 30: This afternoon Mr. Goldstone brought to town some very good ore from the Jack Rabbit mine. The Jack Rabbit is situated ont near Buena Vista and many hundreds of dollars have been taken from the bedrock tunnels, below what is now the quartz vein. The ore shown in town to-day came from the level 300 feet below the surface. Everything in the mine is in a prosperous condition.

A GOOD FIND.—Grass Valley *Telegraph*, July 27: The Mount George mine on Rush creek, owned by Dr. W. C. Jones and others, is showing something new and is proving the truth of what is said in the bible book of Job—that "gold is where they fine (find) it." An ocherous small ledge has been struck that is literally filled with small scales of gold, and the gold falls ont as the rock is broken. This curious find was made while running to cut the main ledge. It is hoped that there is lots of that ocherous gold-bearing rock in the ground there.

MINE STARTED.—To-day the Sanvee M. Co. began work on its mine, with Mr. Frank Dunmaine in charge. The Sanvee ground has heretofore been known as the Golden Treasure, but will hereafter be called the Sauvee mine, worked by the Sauvee M Co. There will be three shifts run with two men to the shift, and counting miners and all there will be for the present about nine men employed by the company. The parties who are operating the mine are very wealthy wholesale druggists from Minneapolis. As soon as the ledge is struck, they intend erecting a ten-stamp mill with all modern improvements.

AAOUNN NEVADA CITY.—*Transcript*, Aug. 1: Last week Willis Silva, who lives out on Park avenue, at the edge of Little Deer creek, took a notion that he would put in a few sluice boxes in his back yard and wash some of the gravel which was exposed to view. He was of the opinion that the gravel would pay a few days' good wages, and he went to shoveling the gravel into the boxes and turned the water from the creek into the sluices. He worked at this for about a couple of days and then started in to clean-up, when, to his astonishment, he not only found some fine gold contained therein, but lying carelessly in the last sluice was a gold nugget as big as a hen's egg. He brought it to town and found that it contained over $300. The finding of that specimen is going to lead to the opening up of the extensive gravel deposits which lie in that part of the city. Several tributers have for some little time been working at the Gold Tunnel mine on Deer creek. They are working on a fine looking ledge. Last week they had a crushing of 16 tons at the Nevada County mill. To their surprise the rock yielded $60 to the ton, or nearly $1000 for the lot. They will go ahead now and get out a big crushing. Dan Gillette and two or three other miners, who have been prospecting a ledge in Meachem's place on Piety Hill, have struck a fine body of ore, some of which will go as high as $500 per ton. Work will be rushed and the mine will be fully developed. At the East Harmony the outlook is very fair. Yesterday two mules, which were purchased at Smartsville, were brought to this city, and now their home will be in the depths of this mine, where they will be employed in hauling the cars containing the rich gravel to the stations, to be hoisted to the surface. The Nevada City mine is looking better than at any time yet. There is plenty of rock in sight, and some of it is of very high grade. That mine is a bonanza. The reports from the Federal Loan continue to be of a very favorable character. It will not be long before the stockholders will be receiving dividends. The West Harmony gives promise of being the biggest gravel mine in the State. The company have been to an immense expense in putting in machinery, in order that the property may be worked in a systematic manner. There is an immense body of gravel opened up and good judges estimate that it will pay from $20 to $30 per ton. If this proves to be the case it surely will be the richest development ever made in this part of the country. The more prospecting that is being done in this district the more it becomes a self-evident fact that there is no better field for prospecting on the Pacific coast than in and around Nevada City.

Placer.

SALSIG.—Placer *Republican*, July 30: The vein east of the Salsig mine, formerly opened by Smith and others, has been sold lately to G. F. Deetken, the mining engineer. It will be opened out by him in the near future. The concentrates, mostly iron and copper pyrites, contained in the rock of this mine show a handsome assay of gold. It is also reported that work will shortly be resumed on the Salsig mine. With improved and cheapened methods of exploitation and milling, a good property is confidently expected to be developed by the owners.

Siskiyou.

QUARTZ AND GRAVEL.—Yreka *Journal* Aug. 1: James Brown has been taking out exceedingly rich quartz from his ledge at Ash Creek, on the Klamath river, which district contains several rich ledges, with good placer mining in the gulches and in Klamath river. Rummell & Co, working a river claim in the Klamath, near Ash Creek, are taking out good pay from the surface gravel in sinking down, which indicates that they will strike exceedingly rich pay at bedrock. It is not expected in river mining to realize any pay of consequence until near bedrock, hence this company is likely to make a big haul when nearing the bed of the old channel. A Medford Co., in the same locality, is also realizing good prospects, with certainty of a big strike on reaching bedrock. Burlison & Co., in the same district, have also been getting fine prospects, and taking out considerable gold dust, with expectation of doing still better before the season closes. The old Capt. Pope mine, Anderson mine, and other river claims between Shasta river and Henley, are also turning out well, to make the Upper Klamath one of the best mining districts in Siskiyon.

HUMBUG MINES.—This has been a prosperous year for Humbug, and the season only half gone. J. F. Boyle's mine has a full force of men working in it day and night to keep both mills running, and they are getting out some rich rock. The Spencer mine has a big force of men taking out some good ore to keep McCook's mill going, with teams hauling every day. Nelson has just completed his new house on his mine just across from the Spencer mine, and has started to work in his shaft. He has a fine prospect, and expects to lay out $8000 or $10,000 on his claim this season. The men employed are down some 30 to 35 feet and have a three-foot vein. Humphrey & Jesseman have struck a good prospect, and intend putting up an arrastre this fall on their mine. They have crushed ten tons that realized 20 ounces, and their ledge is 14 to 16 inches wide. Cartright & Phillips are running their air tunnel, which is in about 160 feet, and have 100 feet further to go before striking the other tunnel. This is one of the best mines in the country to-day, with $40,000 to $50,000 in sight. They are down 300 feet on their ledge, with a vein that will average two feet. They intend to put up a mill as soon as the tunnel is completed. Morrison & Lash are cleaning up, with plenty of water. They are about half done and are doing well. Hegler & Co. are crushing every day, and will start on their other tunnel right away to tap a body of ore above the upper level which prospects well. Humbug is the best camp in the county to-day, with plenty of work, good wages, and a good place to prospect.

Yuba.

A BROWN'S VALLEY BLAZE.—Marysville *Democrat*, July 30: A fire occurred at the works of the Jefferson Gold M. Co., at Brown's valley, shortly before midnight last night. The house built over the hoisting works and shaft was burned, and the machinery considerably damaged. The mine is owned principally by Marysville men, though one or two of the stockholders reside in Sacramento. F. W. Johnson and George W. Harney are principal owners and managers of the works, and they state the loss at $3000, with an insurance of only $900.

NEVADA.

Tuscarora District.

NAVAJO.—*Times-Review*, July 29: The stopes above the 350-level are yielding about the same as at last report.

BELLE ISLE.—West intermediate crosscut above the 350-foot level, extended 5 feet, cutting the vein again and a raise started on it, progress 3 feet.

NORTH BELLA ISLE.—No. 2 upraise, south 500-foot level, extended 19 feet, the vein shows no change. The stopes are looking about the same as at last report.

COMMONWEALTH.—East drift from No. 5 chute advanced 20 feet. face is in ore assaying $22.62 per ton. No. 1 raise, third level, has been put up 15 feet, should reach the ore in about 10 feet further. Commence extracting ore Monday the 1st.

NEVADA QUEEN.—North intermediate drift from No. 7 chute advanced 11 feet, showing bunches of ore. North drift from No. 6 advanced 15 feet, 2 feet of $50 ore in face of drift. North drift from No. 5 extended 18 feet, nothing of value in the face. West drift from No. 1 advanced 22 feet in second-class ore. Stopes continue about the same. 68 61 tons of first-class ore worked at Union mill, battery assay $272 per ton, and 248.6 tons sent to concentrating plant, battery assay $24.62 per ton.

Washoe District.

CON. CAL. AND VA. MINE.—Virginia *Chronicle*, July 30: 1500 level—From the south drift at point of connection with the old stopes we continue to extract some ore and fillings of average milling value. From the upraise which was carried up from the end of the crosscut run west 36 feet in from the main south drift, 155 feet south from the shaft station, we have continued to work upward and to extract ore of fair quality. 1650 level—Continued to extract some ore from the drift run east from the winze No. 3 (down 73 feet) in working upward from that point. Also some ore from the old stopes at the north end of the California ground. 1750 level—In east crosscuts Nos. 1, 3 and 5 from the main south drift, in working upward from the sill floor, have continued to continued to extract some milling ore. From the end of the drift run south, 88 feet from the end of the crosscut run west from the end of the south west drift, an upraise has been carried up 53 feet in a porphyry formation carrying streaks of quartz of low assay value. There have been extracted from all parts of the mine during the week 1008 1460-2000 tons of ore which was shipped to the Morgan mill, the average valne of which, per car samples, was $26.82 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $25.05 per ton, per battery samples. Bullion shipped to Carson Mint, assay value $26 531.90. Bullion on hand in our assay office, assay value about $14.700.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, at a point 84 feet in from its mouth, the west crosscut has been advanced 22 feet; total length 68 feet, continuing in quartz formation which carries a very low assay valne.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet feet below the sill floor of this level neer the south boundary of the mine, at a point 40 feet east from the winze, has been advanced 18 feet; total length 189 feet; in porphyry showing clay separations.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 25 feet; total length west from the joint shaft 2252 feet; the face is in porphyry and streaks of clay and quartz.

UTAH.—340 level—From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 47 feet; total length 92 feet; continuing in porphyry and clay formetion, showing fine lines of quartz.

SIERRA NEVADA.—The east crosscut No. 2, 200 feet south of No. 1, 100 feet in Kenosha tunnel, has been advanced 35 feet; face in porphyry and streaks of quartz. The joint Sierra Nevada and Union west drift, 900 level, is in west of shaft of 2252 feet; face in porphyry and small streaks of clay and quartz.

ANDES.—East crosscut No. 1 north on 420 level, advanced 8 feet; formation qnartz and porphyry. Repair work was done in north drift.

GOULD & CURRY.—200 level—Northwest drift, started 435 feet west of shaft, has been extended 14 feet through porphyry; total length 438 feet.

BAST & BALCHER.—900 level—During the past week west crosscut No. 1 has been advanced 11 feet through hard porphyry and stringers of quartz; total length 406 feet.

HALE & NORCROSS.—1800 level—The north drift started from station was advanced 35 feet; total length 35 feet; face in porphyry. The south drift on this level was advanced 30 feet; total length 30 feet; face in porphyry. These drifts are outside of and east of the ledge.

POTOSI.—Have completed timbering the station at top of Potosi winze, 900 level, and put the new hoisting gear in place. Are running an east crosscut 40 feet north of Potosi winze, 1100 level; face in porphyry and streaks of quartz. Extracted and sent to the mill in the past week 437 900-2000 tons of ore from the 1100, 1150 and 1200 levels. Milled during the week 473 tons. On hand at mill 107, 1500-2000 tons; average battery assay $21.39; averega car sample assays $27 09. Shipped to Carson Mint 452 pounds of crude bullion.

WARD COMBINATION SHAFT.—The joint Alpha and Exchequer south drift from the north line of Exchequer 1800 level of Ward shaft, has a total length of 314 feet; face in cley and porphyry.

BULLION.—Have completed timbering the station at top of Potosi and Bullion joint winze, 906 level, and put the new hoisting gear in

place. The 1500 east crosscut, 300 feet south of north line, is in 75 feet; face in porphyry. The joint northeast drift from the 1800 station, Ward shaft, has a total length of 314 feet; face in hard porphyry.

ALPHA.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 314 feet; face in quartz, clay and porphyry.

EXCHEQUER.—The joint Exchequer and Alpha south drift from north line of the Exchequer, 1800 level of Ward shaft, has a total length of 314 feet; face in quartz, clay and porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels, have extracted and milled 175 tons of ore of the average assay value of $22.35 per ton as per battery samples. West crosscut No. 4, on the 750 level, has been extended 8 feet; in hard vein porphyry. East crosscut from Zadig shaft, Sutro tunnel level, has been advanced 22 feet in favorable-looking vein matter.

CON. NEW YORK.—The winze in No. 4 west crosscut, 650 level, is down on the slope 48 feet, following a streak of fair-grade ore.

SILVER HILL.—The raise in the south drift, 800 feet from the Justice shaft, 490 level, has been connected with the northwest drift on the 600 level.

CHOLLAR.—Are making repairs on the 450 and 650 levels. The east crosscut near the north line, 900 level, is in 69 feet; face in soft porphyry.

Ferguson District.

PROCESSINO.—Pioche *Record*, July 28: Mr. Hutchinson came up from Ferguson last night and reports things progressing favorably in the Magnolia. He will probably return there in a day or two, accompanied by Messrs. Eames and Sevenoaks, both of whom are now interested in the property. Preparations are being made to do a large amount of development work. The present shaft is being widened and timbered from top to bottom, and sinking will be commenced in a day or two. A contract has also been let on the crosscut tunnel on the north side of the hill. It is expected the vein will be cut inside of 50 feet. The tunnel has already been driven about 30 feet by the old owners. George Petty returned from Ferguson district Tuesday with samples from a 20-foot ledge which he has been prospecting for some time. The samples brought in assay $800 in silver and eight ounces or about $160 in gold. The ledge is a very promising one, and work will be prosecuted with vigor as soon as the heat moderates.

ARIZONA.

GOLD CAMP.—Tombstone *Prospector*, July 26: There is quite a stir at Gold camp. The English mine continues to improve with depth. The shaft is down 70 feet in two feet of $50 free milling ore. Steps are being taken to erect five stamps at the mine. A. Bauer and John Pierce have a claim in the Golden Rule district that is producing an abundance of very rich carbonate ore. The rich strike near the State of Maine, which is the property of Ingram and Fitts, continues to show up ore of marvelous richness. The ten stamps at Soldier Holes are pounding steadily away on Silver Bill ore. About 35 tons per 24 hours is reduced, and there is no doubt but that, with additional pans and concentrator, between 50 and 60 tons can be easily passed through every 24 hours during the month. The T. M. & M. Co.'s properties continue to produce the same heavy shipment of ore. There has been no change in the water since our last report. It is expected that the Old Guard will start next month. The last of the judgment indebtedness was paid off on Friday last, and the property is clear of all incumbrances.

AT TOMBSTONE.—*Prospector*, July 30: J. J. McClelland, who is at present in Louisville, Kentucky, is forming a substantial company to work the claims owned by him and A. Y. Young, near the lime kilns, about two miles northeast of town. Some very rich float has been found in that vicinity, and a large amount of development work has been done. Stringers of ore have been found, but it is only with depth that the large bodies of ore which run there can be tapped. The mineral belt, upon which are located the big bonanzas of the camp, will be found there, with development work sufficient to go 300 feet. One of the coming bonanzas of the camp is a three-cornered piece of ground upon which Jim Young found a piece of ore in place about two months ago. He let Chas. Smith into it and a shaft was started. It is down 35 feet, and is one of the most flattering prospects in the camp. Some of the ore is very rich and many sacks of first-class ore will go 500 ounces. About five tons of ore are already sacked ready for shipment, and this was taken out in sinking the shaft. The claim is located within a stone's throw of the courthouse. The slag dump at the Charleston smelter will be cleaned up to-day, and work upon it will have been completed. It has kept on an average of 20 men employed for 18 months, and has yielded a handsome sum to the company. There is some talk of taking down the big stamp mill at Charleston, which will save the heavy expense of a watchman, insurance and taxes. The company also have a fine smelting plant there. Only good reports come from the T. M. & M. properties and the Turquoise and Soldier Holes. The Fitts and Ingram mine, near the Maine, is showing better than ever; chloriders on Col. Herring's mine, in the same vicinity, are well satisfied, and, taken on the whole, the outlook is more than encouraging.

AZTEC.—Prescott *Courier*, July 26: Gov. Tritle has given the *Courier* some very nice looking specimens taken from the prehistoric shaft recently found by him on the Hassayampa. He calls the new, or rather the old, find the Aztec; says the vein is five feet in width, ore goes 60 per cent lead, $26 silver and $12 gold; ledge can be plainly traced along the top of the ground 450 feet north from the Hassayampa. Mr. Austin, representing the London Limited Pyritic Smelting Co., who went out to look at the Blue Dick, also examined the Aztec and its ore; said the component parts of the ore were just what his company wanted, taken in connection with other ores in the district, and he expected to make a favorable report to his company, which, he thinks, will put up at that point a 50-ton smelter, the capacity of which can be increased from time to time as the output of ore justifies. Mr. Austin has examined the neighboring properties, and is convinced that his company can treat any of the ores he has seen, at a cost not to exceed $15 per ton.

OREGON.

THE ROBBINS-ELKHORN.—*Bedrock Democrat*, July 30: Supt. J. H. Robbins, of the Robbins-Elkhorn, was in the city yesterday and to a reporter stated that everything is running smoothly at the mine, and that from this time on the company will ship two carloads, or 40 tons of concentrates per week to the Tacoma smelter. While this is a very expensive mode of handling the concentrates, yet the company realizes handsome profits. It costs $1.25 per ton to transport the concentrates from the mill to the city, and the railroad company charges $12 per ton from Baker City to Tacoma. Supt. Robbins says that the regular rate should be $9 per ton, and he expects soon to receive the reduction. The cost of reduction is $11 per ton, making the total expense $24.50 per ton. The smelting company allows 15 cents a unit for all iron in excess of silica, and as the Robbins-Elkhorn concentrates go 38 per cent in iron and 8 per cent in silica, the company receives a neat reduction, amounting to $4.50 per ton and reducing the cost to $20 per ton. Mr. Robbins will make his regular monthly clean-up on the 1st, and he says the output will be up to the usual good standard.

SPAETA.—The Golden Gate Mining Co. is pushing development work on its mine, which is the most promising free gold property in the State. A large force of miners is working for the Eastern Oregon Gold M. Co. of Detroit, Mich., on the Marotte property situated at the foot of Old Baldy mountain. The mines are showing up well, and it is certain now that a large milling plant, complete in every particular, will soon be erected here, to be operated strictly as a custom mill. This is what is needed, and this will pay the promoters of the enterprise at least 25 per cent annually on their investment.

WASHINGTON.

NEW MINING DISTRICT.—Okanogan *Outlook*, July 27: The miners and prospectors of Bridge creek and tributary mining camps held a meeting and passed resolutions for the organization of a new mining district, the boundaries of which are as follows: Beginning at the month of Agness creek and running westerly along the summit of the divide between Agness creek and the waters of the Stehekin river to the summit of the Cascade mountains, thence northerly along the summit of the Cascade range to the point where the divide between the Methow and Bridge creek joine the main range, thence southerly along the divide that separates the waters of the Methow river from those of the Stehekin system to a point opposite the mouth of Agness creek. Within the boundaries of this district are situated the camps of Bridge creek, Park creek, Horse Shoe basin, Little lake and north fork Bridge creek. The records of the district will be kept at the office of Wilkeson and La Due, near the mouth of Bridge creek.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 26, 1892.

479,612. — WEEN CUTTER — G. S. Andrews, Walla Walla, Wash.

479,545.—FOLDING CRATE—C. F. Baxter, Manrietta, Cal.

479,490.—KETTLE COVER—N. Crosman, Seattle, Wash.

479 496.—APPARATUS FOR REDUCING BITUMINOUS ROCK—A. Ford, Golden Gate, Cal.

479,644.—STRAW FUEL FEEDING APPARATUS—B. Jackson, San Francisco.

479,650.—FRUIT PACKEE—A. J. Longnecker, Elk Grove, Cal.

479,521.—SPIRIT LEVEL—E. McCullough, San Francisco.

479 716.—LABEL HOLDEE—C. W. Miller, Clifton, A. T.

479 444.—MINER'S TOOL—N. W. Moodey, Fresno, Cal.

479,570.—MOTOR—R. F. Nichols, Sr., Alturas, Cal.

479,531.—ANNING MACHINE—R. S. Robertson, Artondale, Wash.

The following brief list by telegraph, for Aug. 2, will appear more complete on receipt of mail advices:

San Francisco—John P. McMurray, wall or ceiling covering; William K. Nichols, cash register; William Radford, brick kiln. California—Alpha Buker, Hueoeme, carriage curtain fastener; Eugene T. Burnett, Haywards, preserving eggs; Jonathan Elwood, Sanger, ant or insect guard; Frank X. Fischer, Oakland, boiler; Joseph S Fredlph, Porterville, clasp; Stephen A. Menzemer, Santa Clara, drier.

Oregon—James McCourt, Salem, metric model; Neil Olson, Portland, wagon axle; Charles H. Timms, John Day, Or., door check; Charles W. Tremain, Portland, steam stamp; Charles W. Tremain and S. Johnson, Portland, steam engine.

Washington—Robert S. Dyff, Tacoma, pavement; William H. Starks, Bellevue, strawberry-vine cutter.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 4, 1892.

General trade the past week was fairly active, with a large increase in the volume of goods sent out. The call continues largely of an assortment character. It is claimed that in next month stock buying will set in, when we can reasonably look for a large increase in trade. The low rates of freight secured by sail between New York and this city are being beneficially felt. A great deal more goods are shipped from here, while heavy shipments are being forwarded to us. The lower freights give a decided advantage to importers of those goods for which they are not in urgent need. Remittances from the country are slow, with no improvement looked for until farmers begin to market their grain. Low prices ruling for both wheat and barley are against free selling by producers. The large tonnage in port and to arrive gives assurance of an ample supply of tonnage with which to market the surplus grain at reasonable charters.

The local money market is still reported easy, notwithstanding a report in some quarters that there is a steadily increasing inquiry for funds for crop purposes. There is an almost total absence of speculation in any leading article of trade, outside of fruit, which is calculated to call for much money. At the East the general tenor of advices indicates a strengthening in the money markets, and that is no longer money lenders looking up borrowers, but it is now the latter looking up the former. The labor troubles at the East are, in some quarters, a serious drawback to some lines of trade. There are signs of a returning spirit of speculation in the stock exchanges of New York; heretofore, this has been followed by more life in the various industries of the country.

According to the introduction to Poor's Manual for 1892 the net increase in mileage of all railroads in the United States in the calendar year 1891 was 3898 miles. The mileage in the country has reached 170,601, and the investment over 11 billions, represented by about 4¾ billions of stock, 5¾ billions of funded debt, and 700 millions of unfunded and current debt. The earnings of all roads in the country in the fiscal year 1891 amounted to $1,138,024,459, of which operating expenses absorb $781,796,576, leaving $356,227,883 net earnings. Other income amounted to about 101¾ millions, making available revenue 457½ millions. Payments from this revenue included 225¾ millions interest on bonds, 90¾ millions in dividends, 64¾ millions in rentals, and the remainder in interest on unfunded debt and miscellaneous payments. The excess of available revenue over actual payments was about 40¾ millions. The surplus of roads in the New England group was materially smaller in 1891 than in 1890, and the same was true of the Central Northern group and Southwestern group. Results were nearly similar in the Middle group, the South Atlantic group and the Northwestern group. There was distinct improvement in the Gulf of Mississippi Valley group and the Pacific group. There was a slight increase in the average receipts per passenger per mile and in the average receipts per ton per mile, the latter being .929, compared with .927 in 1890.

SILVER—The market has ruled weak throughout the week. There appears to be an absence of snap and life, as if large operators are awaiting developments pending the international bimetallic conference. It is quite generally accepted that this session of Congress will not legislate further on the silver subject. The coming bimetallic conference is attracting more attention abroad and it looks now as if something practical will result. One of the latest and apparently acceptable schemes put out is that of Prof. Soelbor of Virginia, who recommends that the coming international monetary conference agree that no gold coin containing less than 2.8065 grms. of fine gold be allowed to be coined or circulated in contracting countries; that silver be coined in a proportion of 20 value units silver to one of gold; that silver be legal tender up to $20, and that silver coins of fixed standards of purity be withdrawn from circulation. Professor Soelber considers that everything depends upon the attitude of Great Britain.

MEXICAN DOLLARS—The market has held steady at around 68¾ cts.

QUICKSILVER—Receipts the past week aggregate 405 flasks, and exports by sea 28 flasks to Mexico. The market is said to be unchanged. The ship A. J. Fuller took out 400 flasks shipped to New York.

BORAX—Exports by sea the past week aggregate 2027 ctls. The market is steady at current quotations.

LIME—Receipts the past week aggregate 2006 bbls., and exports by sea to Mexico 2300 bbls. The market is steady at $1.40@1.50 per bbl.

PIG IRON—Imports the past week aggregate 200 tons from New York. The market is quiet at barely steady prices. Imports from Atlantic seaports are against sellers of foreign. Eastern advices report dull and lower markets, but English advices report active speculative trading.

TIN—Both pig and tin plate are in lighter inquiry, but the market is fairly steady. The consumption has been larger than was estimated early in the year. The increased demand came chiefly from canners of fruit, New York mail advices report more speculative dealing, with appearances indicating that it is being done in the interest of the bulls.

PIG LEAD—While the market is reported unchanged, the feeling is easier. The Eastern markets are flat and easy.

COPPER—The market has exhibited slightly more strength, owing to the last of the old French syndicate copper having gone into consumption. The supply and demand, both East and abroad, appear to be so regulated as not to make any violent fluctuations either up or down.

COAL—Imports the past week aggregate as follows: Cons Bay 1250 tons, Nanaimo 2000, New York 200, Cardiff 3505. Total 6955 tons. While the market is not quoted higher, yet the tendency is unmistakably upward. Buyers are now looking up sellers instead of sellers looking up buyers.

Mining Share Market.

SAN FRANCISCO, Aug. 4, 1892.

Mining shares the past week disappointed the many who looked for a sharp move up to follow the break in last week, but perhaps it was the presence of Bob Morrow (D. O. Mills' respected broker) in the Board that kept prices down. If this is so, now that he has gone to his ranch for a few days, the bulls may toy at the game and strengthen the market, for the mice play when the cat is away. The stock pools and mill rings' wicked partners (Carson river ranchmen), in the water privileges of the Carson, have not as yet relented, but still refuse to allow sufficient water—so say insiders—to flow down the river to run *any* of the stamps in the mills. After the managers of the various groups of Comstock mines have one or more assessments levied, and driven in all the shares possible, it is not at all unlikely but the mill rings and stock pools' wicked partners will experience a change of heart and allow plenty of water to flow down the river with which to run the mills to full capacity. If the shares are well in hand, it may also be in order for the inside to show up the rich ore found to the west. In outside shares, trading was at about as low an ebb as ever before known, notwithstanding that in one or more of the mines in each group, ore can be shown up in sufficient quantity to pay dividends. In the Quijotoa mines very important development work has been done lately, and rich ore run into, but the public has been kept in ignorance of the fact. The managers even went so far as not to file the weekly letters of the superintendent; but the president, W. S. Lyle, of two or three of the companies paid a visit to the district. What he saw and did is not for the public to know. His trips cost money, and, it is said, help materially in depleting the treasury so as to give an excuse to levy assessments for the purpose, it is claimed, of freezing out outside shareholders. It is a great game, this of freezing out outsiders after they have paid to develop a property, and only those who should be elsewhere and in a different occupation can be found capable or willing to do the work.

In mining on the Comstock, it is said that some wonderful freaks of nature have been found; but there are many who claim that perhaps the most remarkable discovery in this line is the appearance of such men as Wells, Hirschfeld and Zadig as reformers. They claim that it looks as if wonders will never cease.

At a late meeting of the shareholders in the Savage Mining Co., Charley Hirschfeld read some kind of a reformation resolution which was adopted. Now, since Mr. Hirschfeld is in the reforming business, why does he not have the rich ore in Alpha, of which he is president, shown up? Over two years ago the superintendent, a Mr. Hamilton, reported the ore, gave its assay value and width, and since then there has been an almost continuous round of assessments by the Alpha Company.

If Messrs. Wells and Zadig truly desire to make reforms why do they not make public the superintendent of the Occidental mine, reports of car sample assays of all ores extracted, and the assays and particulars of all new ore found? The above information is as important to shareholders as it is to insiders.

It looks very much as if everything is being made as black as possible so as to discourage and demoralize the public and those who have shares, into selling, and at the same time prevent others from buying. What this is being done for, time alone will tell, at present it gives color to reports that rich ore to the west is being developed for cheap and expeditious extracting, and a desire on the part of insiders not to let outsiders benefit by it.

Our correspondent, E. O. Smith, is informed that Nat Messer, president of the Hale & Norcross mining company did not say that it would be time enough to see about buying or leasing a mill when the insiders secured about all the outstanding shares. What he did say was it would be time to do so when they found enough ore to justify such a course. Possibly Mr. Messer meant what our correspondent says, for there are experienced mining men who are outspoken in saying that there is high grade ore in the mine to the west, and on more than one level, too, which will pay dividends if honestly milled.

M. W. FOX, plaintiff in the Hale & Norcross suit, has filed in this city and Virginia a written bid to the directors of the Savage Mining Co. agreeing to mill Savage ores for one year at $3.50 a ton. He requires that ores shall be delivered at the mill (the cost of delivery not to exceed the cost for delivering Con. Virginia ore at the mill) he shall designate, at the company's expense, and agrees to return in bullion no less than 65 per cent of the car sample assays of all ores of not less value than $20 a ton.

There is no longer occasion for doubting that on the Comstock lode the mines are in splendid condition for working and that when the share market is in better shape for handling, that ore will be extracted and dividends be paid by one or more of the mines. That insiders are steadily buying shares from outsiders goes without saying. The latter seldom, if ever, buy when a campaign of fraud has been waged. Whether the inside has taken advantage of the developments in the Hale & Norcross suit to besmirch themselves so as to disgust outsiders with the business, is as yet an open question. There are many who incline to the opinion that they have done so, but in the absence of posi-

tive proof, it is well to be skeptical on the subject. That the rings and pools succeeded in getting large lines of stocks since the soit cannot be denied, but how much more they want before showing up the ore on the Comstock and in two of the outside districts, no one appears to know.

U. S. Senator John P. Jones writes to the Mining Stock Association that he has no personal interest in any mill on the Comstock, and has not had for a long time past. It was not much more than a year ago when a paper in this city, the *Daily Report*, stated that Hayward & Hobart had disposed of their interest on the Comstock. This denial held good until the Hale & Norcross soit showed that they were largely interested on the Comstock.

It is stated by those who should know, that arrangements have been made to introduce electricity as a motor in the Bodie district. Fuel has always been expensive in that district, and with electricity a big saving will be made.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb ... — @	15	English, lb..... — @	18
BORAX.		Cantou tool..... — @	8½
Refined, in car lots — @	7½	8/4 Diam'd tool	8½@ 15
Fowdered, do.. — @	7½	Pick & Hammer	6@ 10
Concentrat'd,do — @	6½	Machinery..... 4 @	5
All grades jobbing at advance		Foe Calk..... — @	4½
COPPER.		**TINPLATE**	
Bolts..... 22 @ —		B. V. steel grade	
Sheathing..... 22 @ —		14x20, spot..... — @	6 00
Ingot, jobbing.. — @	14½	Charcoal, 14x20. — @	6 00
Do, wholesale.. — @	13½	Do roofing, 14x20 — @	6 00
Fire Box Sheets 22 @	24	Do, do, 30x28.... — @	12 00
IRON.		**PIG TIN.**	
Bar, base..... — @	3	Spot ₱ lb..... — @	24
Norway, base.... — @	4½	**COAL.**	
PIG IRON.		**SPOT FROM YARD—PER TON**	
Spot.		Wellington.....	$8 00
Eglinton ₱ ton...22 00@ —		Gretta	6 75
Glengarnock.....23 00@ —		Nanaimo	7 00
Am. Soft, No. 1..24 00@ —		Gilman.....	6 00
Oregon Pig..... —@ —		Seattle	6 50
Puget Sound..... —@ —		Coos Bay	5 50
Olay Lane White..24 00@ —		Cannel.....	8 50
Langloan..... 22 0@ —		Egg bard	11 50
Thorncliffe.....23 00@ —		Cumberland, in sacks....14 00	
Gartsherrie .....22 00@ —		Do, bulk	13 00
Barrow..... 22 00@ —		Wallsend.....	7 00
Carnforth.....22 0@ —		Scotch Splint	7 00
CHROME IRON ORE.		Brymbo	6 75
Per ton.....10 00 @ —		West Hartley.....	7 50
LEAD.		**TO LOAD—PER TON.**	
Pig..... — @	4½	Australian..... 5 75@ —	
bar..... — @	5½	Liverpool Steam 6 00@ —	
Sheet..... — @	7	Scotch Splint... 6 00@ —	
Pipe..... — @	6½	Cardiff. ..... 6 25@ —	
SHOT.		Lehigh Lump.... 12 00@ —	
Drop, sizes *smaller* than		Cumberland..... 9 00@ —	
B, ₱ ag of 25 lbs.. $1 85		Egg bard ..... 10 00@ —	
Do do, B and la gersizes	2 10	West Hartley.... 8 50@ —	
₱ ag of 2 lbs		**COKE.**	
Buck. Balls and Chilled		English, to load..$3 00@ 9 00	
do, ₱ bag of 25 lbs..... 2 10		Do, spot, in bulk.— @10 00	
QUICKSILVER.		do, in sacks..... — @12 00	
Home trade, per flask .....43 50 @44 00		Cumberland..... 9 00@ —	
For export..... 38 @			

Table of Lowest and Highest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 13.		Week Ending July 20.		Week Ending July 27.		Week Ending Aug. 3.	
Alpha.....	.20	.25	.20	....	.15	....	.10	.15
Alta.....	.20	.25	.25	.30	.25	.30	.25	....
Andes.....	.40	.45	.35	.40	.35	....	.25	.30
Belcher.....	1.25	1.65	1.15	1.35	.85	1.15	.85	.95
Belle Isle.....	.05	....	.05	....	....	....	....	....
Best & Belcher.....	1.80	1.90	1.55	1.90	1.50	....	1.25	1.50
Bullion.....	.50	.55	.30	.50	.30	.35	.25	.35
Bodie Con.....	.20	....	.10	.15	.30	.3	....	....
Bulwer.....	.45	....	.40	.45	.40	.45	.40	....
Commonwealth.....	....	....	.05	.15	....	....	....	....
Con. Va. & Cal....	3.60	3.90	3.60	3.85	3.50	3.65	3.20	3.30
Challenge.....	.55	.60	.40	.50	.30	.35	.25	.30
Choller.....	.55	.80	.60	.75	.45	.60	....	....
Confidence.....	1.80	....	....	....	....	....	1.30	....
Con. Imperial.....	.15	....	....	....	....	....	....	....
Caledonia.....	.25	....	.20	....	.20	....	.10	.15
Crown Point.....	.90	1.15	.75	.95	.55	.75	.55	.60
Crocker.....	....	....	....	....	....	....	....	....
Del Monte.....	.05	....	.05	....	.05	....	....	....
Eureka Con.....	2.25	....	....	....	....	....	....	....
Exchequer.....	.15	....	2.10	....	.10	....	....	....
Grand Prize.....	....	....	....	....	....	....	....	....
Gould & Curry.....	.85	1.10	1.00	1.05	1.00	....	.80	.90
Hale & Norcross....	1.30	1.45	1.20	1.35	1.10	1.20	.95	1.05
Julia.....	.05	....	.05	....	....	....	....	....
Justice.....	.15	....	.15	....	.10	....	.05	....
Kentuck.....	.10	.15	.15	.10	.05	....	.05	....
Lady Wash.....	.10	....	....	....	....	....	.05	....
Mono.....	.40	.45	....	....	.30	....	....	....
Mexican.....	1.55	1.70	1.50	1.70	1.35	1.55	1.25	1.35
Navajo.....	....	....	....	....	....	....	....	....
North Belle Isle....	.05	....	....	....	....	....	.05	....
New Queen.....	.30	.45	.35	.55	.20	.45	.20	....
Occidental.....	.35	....	.35	....	.30	....	.30	.35
Ophir	2.35	2.80	2.50	2.75	2.30	2.65	2.05	2.25
Overman.....	.60	.70	.40	.50	.40	.50	.25	.30
Potosi.....	.45	.70	.40	.50	.40	.50	.45	....
Peerless	....	....	....	....	....	....	....	....
Peer.....	.05	....	....	....	....	....	....	....
Savage.....	1.30	1.55	1.10	1.30	.95	1.10	.90	1.00
S. B. & M.....	.30	.35	.25	.30	.20	....	.15	....
Sierra Nevada.....	.90	*1.20	1.16	1.25	.95	1.05	.90	1.00
Silver Hill.....	....	....	.05	....	.05	....	....	....
Scorpion.....	....	....	....	....	....	....	....	....
Union Con.....	.95	1.10	.85	1.10	.70	.85	.70	.75
Utah.....	.65	* 35	.25	.30	.20	.25	.20	.25
Yellow Jacket.....	.50	1.00	.65	.85	.40	.65	.45	.55

*Assessment added.

Eastern Metal Markets.

NEW YORK, Aug 3.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday.....	39 3-16	85	11 75	4 05	20 75
Friday.....	39½	86¼	11 75	4 05	21 60
Saturday.....	39 1-16	85¼	11 70	4 10	20 90
Monday	39 1-16	87½	11 75	4 10	21 30
Tuesday.....	39 1-16	85½	11 75	4 10	21 10
Wednesday	39 1-16	85¼	11 70	4 05	20 60

Copper has held fairly strong. Lead has ruled easier. Tin has fluctuated, but the general tendency was to lower figures. Quicksilver has been weak at shaded prices. Iron has been barely steady.

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GEO. WILSON—Sacramento, Cal.
SAMUEL B. CLIFF—Creston, Cal.
MRS. BRUCE B. LEE—Tehama Co.
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R. G. HUNTON—Montana.
CHAS. E. TOWNSEND—Sierra and Nevada Cos.
A. C. GONPREY—Oregon.
W. H. MURRAY—California.
E. B. FOSTER—Santa Cruz Co.

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COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alta S M Co, Nevada	42	15c	June 18, July 20	Aug 16	L Osborn, 309 Montgomery
Belle Isle M Co, Nevada	14	15c	June 16, July 21, Aug 12		J W Pew, 310 Pine
Bodie Cons M Co, California	14	25	June 20, July 21, Aug 22		H D Walker, 3 9 Montgomery
California Verde Antique Marble Co, Cal	2	1c	July 12, Aug 22, Sept 12		W J Gurnett, 308 Pine
Commonwealth Cons M Co, Nevada	8	10c	June 15, July 21, Aug 18		R R Grayson, 331 Pine
Cons New York M Co, Nevada	8	10c	June 18, Aug 2, Aug 23		C E Filloit, 309 Montgomery
Exchequer M Co, Nevada	33	15c	July 27, Aug 31, Sept 20		C E Elliott, 309 Montgomery
Florida Hill M Co, Idaho	4	3c	July 22, Sept 2, Sept 29		R R Grayson, 331 Pine
Gold Mt M Co, California	3	82	July 16 Aug 30, Sept 8		J F Curtis, 325 Montgomery
Golden Fleece Gravel M Co, California	17	--	July 16, Aug 24, Sept 20		W J Gleason, Phelan Block
Gover M Co, Oal fornia	3	10c	July 28, Sept 1, Sept 28		R McF Doble, 15 Fremont
Gray Eagle M Co, California	29	5c	July 6, Aug 9, Aug 13		A W Barrows, 303 California
Justice M Co, Nevada	51	40c	July 26, Aug 31, Sept 19		G R Kelly, 419 California
Kentuck M Co, Nevada	4	10c	July 1, Aug 18, Sept 8		J W Pew, 310 Pine
Mexican Phosphate and Sulphur Co	1	1 c	June 8 July 18 Aug 8		A Halsey, 328 Montgomery
Mountain Tunnel M Co, California	5	7c	July 18, Aug 27, sept 26		F C Lander, 219 Sansome
Ophir M Co, Nevada	18	50c	June 3, July 7, July 27		E B Holmes, 3 9 Montgomery
Peer M Co, Arizona	13	10c	July 19, Aug 25, Sept 23		A Waterman, 3 9 Montgomery
Peerless M Co, Arizona	18	5c	July 6, Aug 11, Sept 7		A Waterman, 309 Montgomery
Scorpion M Co, Nevada	23	5c	July 11, Aug 14 Sept 12		G R Spinney, 310 Pine
Sierra Nevada M Co, Nevada	1-2	2½c	June 10, July 13 Aug 2		E L Parker, 309 Montgomery
Silver Hill M Co, Nevada	31	5c	Aug 2, Sept 6 Sept 27		D C Bates, 309 Montgomery
Silver King M Co, Arizona	8	2½c	July 19, Aug 27, Sept 27		J W Pew, 310 Pine
Union Cons M Co, Nevada	46	25c	July 18, Aug 24, Sept 13		A W Barrows, 303 California
Western Star M Co, California	1	7c	July 25, Aug 30, Sept 21		J A Reed, 328 Montgomery

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Alta S M Co, Nevada	Annual..	C E Elliott, 309 Montgomery	Aug 6
Con New York M Co, Nevada	Annual...	C E Elliott, 309 Montgomery	Aug 6
Jack Rabbit M Co, Nevada	Annual....	T Wetzel, 320 Sansome	Aug 8
Julia Con M Co, Nevada	Annual....	J Stadfel d, 3 9 Montgomery	Aug 20
Martin White M Co, Nevada	Annual....	K L Ross, 120 Sutter	Aug 18
South Feather W & Union Co, California	Annual....	J Coffin, 220 California	Aug 8

LATEST DIVIDENDS.

Company and Location.	Amount.	Secretary and Office in S. F.	Payable.
Bulwer Cons M Co, California	10	L O.h rue, 3.9 Montgomery	April 28
Champion M Co, California	5	T Wetzell, 310 Pine	July 18
Co s Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Buse, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Aug 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 28

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

IRMA GOLD-MINING Co. Capital stock, $1,000,000. Directors—W. H. Bodwell of Santa Clara, J. F Sims of Berkeley, J. E. Markley of Oakland and L. A. Bodwell and William H. Robinson of this city.

HONEYCOMB MINING Co Location, Ynba conuty. Capital stock $100,000. Directors—Henry Mallock, George W. Pine, F. W. Johnson, O. G. Mayo, W. B. Meek.

MOUNTAIN VIEW WATER Co. Object, to conduct the waters flowing from the laguna on the summit, San Antonio, Adohe, Matiadero and other creeks in Santa Clara conuty to the residents of Fremont Township and the inhabitants of Mountain View, Mayfield and Palo Alto. Capital stock, $500 000. Directors—Otto Arnold of Mountain View, Bradford W. Smith and L. F. Richling of Oakland, and Christian F. Ruppel and William Mnehe of this city. Arnold holds 1000 of the 1050 shares of the par value of $10 each.

GERMAN MUTUAL SAVINGS BANK. Location, Oakland, Alameda Co. Directors—Jacob Greenwood, C. C. Nordhansen, William Moller, J. C. Westphall, R. F. Christ, A. Kayser, J. F. Sohest, C. Jurgens, S. M. Babbitt, William Nelle and A. C. Henry.

SAN FRANCISCO AND DENVER RAILWAY Co. Capital stock, $12,000,000. The object of the incorporation is to construct a standard gange road from a snitable point on San Francisco hay in Alameda conty in a general easterly and sontherly direction throngh the connties of Alameda, Contra Costa, San Joaqnin, Stanislans, Merced, Tnolnmne, Mariposa, Fresno, Inyo and Mono to a convenient point on the State line between California and Nevada. The length of the proposed road is estimated at 300 miles. The directors, who live in this city, are Thomas R. Hayes, Daniel E. Hayes, James Joyes, Charles E. Alberger, and Wm. C. Alherger. The project seems to have been conceived hy W. C. Alherger, the civil engineer. He came ont here in 1883 to associate himself with Wilhnr's San Francisco and San Joaqnin Valley Railroad. He soon retired from that enterprise. Since then his interest and ambition have nnrsed the plan of a new transcontinental road, and while carrying on irrigation and other engineering enterprises, surveys and plans for the railroad have qnietly progressed and have apparently been stimnlated into greater activity hy the recent agitation for a competing road. Mr. Alherger says that the men financially interested in it were all men of wealth in Enrope, who had large investments in similar enterprises. The incorporators were merely friends of his who had no active interest in it. Terminal facilities somewhere on the eastern shore of the hay had been bonded, half the rights of way secured and surveys had been made which determined very closely the cost of the road. The ronte in a general way would run sonth of Stockton, close to the north side of the Yosemite valley, and on throngh central Nevada, providing a line between San Francisco and Denver 250 miles shorter than the Central Pacific. There were two or three alternative rontes across the monntains. The road would be in a position to hnild np a large local traffic. No assistance other than rights of way would be asked here.

J. ROYLANCE BRASS WORKS. Capital stock, $100 000. Directors—Joseph Roylance, Chas. H. Dunton, Thos. A. Downing, E. A. Downing and Leon St. Denis.

LA PURISSIMA BITUMEN AND OIL Co. Capital stock, $500,000. The objects are to mine for asphaltnm and bitnminous rock and to bore wells for the extraction of petroleum. Directors—E. B. Hill of Lompoc, A. S. Hnbbard, Leo C. Williams, J. F. Holling and C. B. Tilley of this city, with the last two named holding each 12 000 and Hill 50,980 of the snbscribed for shares.

BECK, PYHER & Co. Capital stock, $100,000. Object, to carry on the business of dealing in wines and liqnors. Directors—Adolph Beck of Alameda, Berthold and Felix Pyhrr, Leo Kalman and Ernest F. Tamm of this city.

WASHINGTON AND COLUMBIA RIVER R. R. Co. (Walla Walla, Wash.) Capital stock, $3,000,000. Directors—L. Ankeny, W. D. Tyler and F. W. Paine. The object of the corporation is to hnild a road from Hunt's Jnnction to Puget sonnd; also to hnild a road from Pleasant View, the terminal of the Oregon and Washington Territory Enreka Flat branch, to Riparia. The new corporation is nnderstood to be a reincorporation of the Oregon and Washington Territory, which road it expects to acquire by purchase.

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Assessment Notices.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 12th day of July, 1892, an assessment (No. 2) of One Cent per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 3 8 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 22d day of August, 1892, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 12th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors.

W. J. GURNETT, Secretary

Office 3 8 Pine Street, San Francisco, California.

GOVER MINING COMPANY. LOCATION OF PRINcipal place of business, San Francisco, California; location of works, near Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 28th day of July, 1892, an assessment (No. 3) of Ten Cents (10c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Treasurer of the Company, at his office, Nos. 13 and 15 Fremont Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Thursday, the 1st day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 26th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

ROBERT McF. DOBLE, Secretary.

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST BORAX COMpany, San Francisco, July 30, 1892 At a meeting of the Board of Directors of this above-named Company, held this day, a Dividend (No. 20) of One Dollar ($1.00) per share was declared, payable WEDNESDAY, August 10, 1892, at the office of the company, No. 101 Sansome Street, Room 28. Transfer books will close August 6, 1892, at 3 o'clock, P. M.

ALTON H CLOUGH, Secretary.

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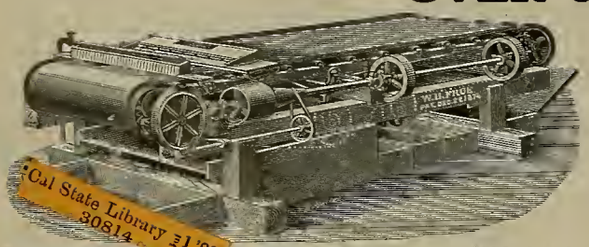

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SAN JACINTO ESTATE, LIMITED,
Office of General Manager,
P. O. Address, South Riverside, San Bernardino Co., Cal.
CAJALCO, Dec. 18, 1891.

MESSRS. ADAMS & CARTER, 132 Market Street, San Francisco, Cal.—GENTLEMEN: After a continuous trial of different concentratore comprising the Frue Vanner, the "Holland," "Parad x," "Triumph" and t e "Woodhur" concentrators), extending over several mon hs, we find that we prefer the Frue Vanner, as it is easier of adjustment, runs smoother, has less wear and tear, and—having a positive travel—gives less trouble than the other m re complicated and ever changing mac ines now in use here. The Frue Vanner not only saves a cleaner concentrate, but has less loss in the tailings, and is in several ways preferable to the other concentratore here.

I am, my Dear Sirs, Yours faithfully,
S. HARRIS, Manager.

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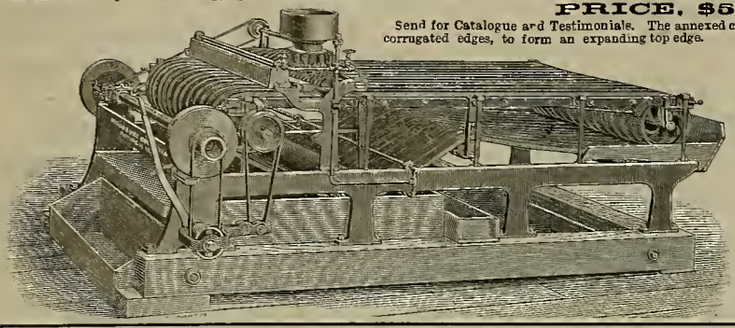

THE SAN JACINTO ESTATE—Office of the General Manager. CAJALCO, Oct 30 '91.
GEO. E WOODBURY ESQ.—Dear Sir: I reply to yours of the 27th i st., respecting the working and efficiency of the "Woodbury" Concentra or placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machi e and is doing fully one-third more work, with the concentrates e nally clean, as from either of the machines at work here.
[Copy] Yours faithfully, S. HARRIS, Manager.

THE SAN JACINTO ESTATE, LIMITED—Office of General Representative, P. O address, South Riverside, San Bernardino County.
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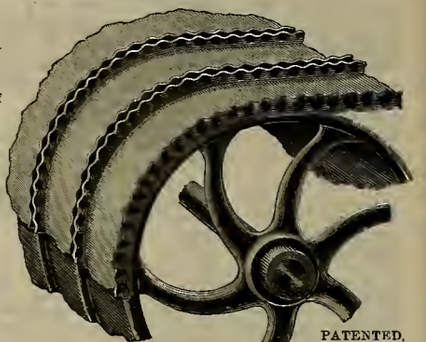
GEO. E. WOODBURY:—Your letter of inquiry about your concentrator came to hand in due course. Your machine is doing well, the motion is all right, and the machine is giving entire satisfaction. Yours faithfully
S. HARRIS.



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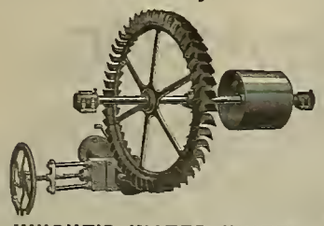

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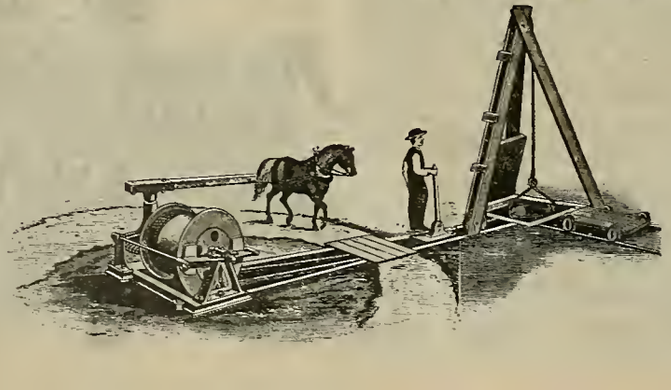

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The bevel gear on the drum shaft is loose, and, in hoisting, drives the drum through a friction clutch. This avoids the frequent accidents occurring with other Whims, occasioned by the breaking of the gear teeth when throwing them on of gear. In lowering, the drum is pressed by a powerful screw lever against brake woods at the opposite end Perfect means of adjustment are provided for the friction clutch and brake blocks.

As the drum is entirely independent from the driving gears the operations of hoisting, dumping bucket and lowering can be performed with the horse in constant motion, a feature not possessed by any other horse hoist in the market, and one that greatly increases the capacity of the machine by avoiding the loss of time due to stopping and starting the horse

It is very light and compact and very easily taken to pieces for transportation by mules. The cost of erection is very small, two men in half a day being able to put it in place ready for work.

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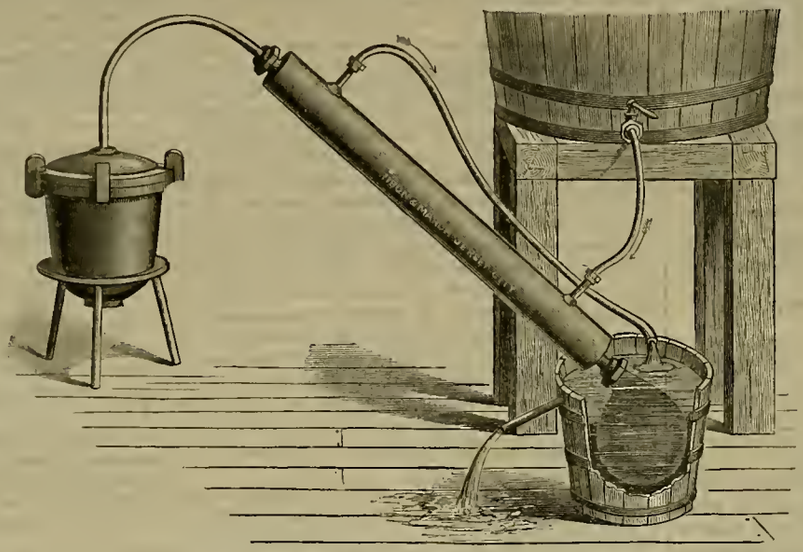
The Hydraulic Mining Bill.

Congress has adjourned, and the Caminetti Hydraulic Mining bill failed to pass the Senate and goes over until next session. The leaders of the two political parties each lay the failure to the other side, but at any rate it did not get out of the Senate Committee's hands to be submitted to a vote. The fact is, three calls for a session of this committee were made, at neither one of which was a quorum secured, but it was found two of the members present were opposed to some portions of the bill. A majority report for the bill, however, might have been forced by Senator Felton if the committee could have been got together. In that event, there would have been opposition to its passage when it came up for hearing in the Senate. As there was no possibility of its being considered in the Senate this session for want of time, and in accordance with the taut agreement of Senators upon both sides that no new measures would be considered which would delay adjournment, it seemed clear to Senator Felton and other friends of the measure that it was better to defer the report until the meeting of the next session, with a view and the possibility and probability of obtaining a unanimous report when it is hoped to pass the measure. Should the Senate Committee have reported the bill, it would have been reported with several minor amendments, which would have necessitated its again being sent to the House for its concurrence, which there was no likelihood of obtaining this session.

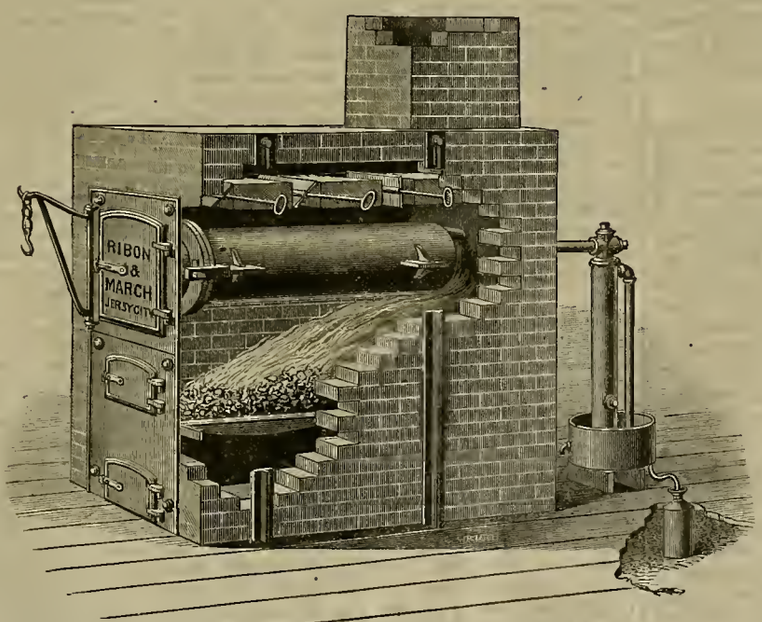
All those interested will now have sent them a copy of the bill as it passed the House. The object is to obtain favorable action upon such a measure as will promote the mining industry rather than to have a report from a committee which, under the circumstances, would have been of no practical benefit, but, on the contrary, might have jeopardized the final result. The miners will have to have patience and wait; but while they are waiting, it is just as well to remind them of the pledges of the Miners' Association to the effect that all hydraulic mining shall cease until the Government takes action. Those men who persist in working contrary to these pledges have already jeopardized the whole cause, and are liable to do still further harm. The man who continues to mine by hydraulic process under the circumstances should be considered an enemy to the hydraulic mining industry of California.

Retorts and Condensers.

The cuts on this page illustrate retorts and condensers for retorting gold and silver amalgam. The retorts are turned smooth throughout inside and are of a shape peculiarly adapted for rapid and complete evaporation of the quicksilver. The condenser attachment, shown in the first cut, which is made of either brass or iron, is, as will be observed, of very important use in facilitating the process of retorting by decreasing the time required, and permitting of a more perfect condensation of the quicksilver through its automatic action; adding but little to the cost. and can be applied to any retort pipe, as it is not a fixture, and if made of brass will not rust. The rubber bag attached to the end of the retort pipe prevents all danger of explosion. It should, of course, be immersed in a vessel containing water. The distention of the bag indicates that quicksilver is still being condensed, and its collapse indicates that the operation is complete. The tripod or retort stand can be readily and cheaply made by any blacksmith.



RETORT AND CONDENSER FOR SMALL GOLD MILLS.



HORIZONTAL RETORT AND CONDENSER FOR GOLD AND SILVER AMALGAM.

The second cut represents a retort for gold or silver amalgam, where the capacity required exceeds 1200 ounces. Several sizes of this design are made of capacities from 150 to 1200 pounds, Troy weight, of amalgam, when two-thirds full. They are made so that when the lower part becomes blistered or burned they can be turned over, ensuring a double life. These forms of retorts and condensers have been adopted from designs furnished the Joshua Hendy Machine Works of this city by Messrs. Ribon & March, of Jersey City, New Jersey. The condensers are built from new designs, and deliver the quicksilver, as is shown in the cut, directly into the flask without handling or loss.

A New Anti-Debris Association.

On Saturday last, representatives of five valley counties met at Sacramento in convention. They adopted resolutions condemning the Caminetti bill and any bill authorizing the construction of debris dams. How they expect to keep back the debris now in the streams without such dams was not explained. Still, as these men are not engineers, and have no experience in such matters, their opinion will carry no weight when opposed to that of the Government engineers, who recommend the dams to remedy the debris evil. The convention had to confess that the Antidebris Association was expending a great deal of money and accomplishing nothing. People are evidently tired of paying the bills for watchmen, and antidebris "grass is short." There was a great deal of talk in going over the old ground, and the same old antidebris leaders bobbed up serenely and gave their views which time, fact and circumstance have not changed in the least.

The outcome of the whole convention was a decision to form a General Anti-Debris Association, to consist of one member of the Boards of Supervisors from the counties of Sutter, Butte, Yolo, Solano, Colusa, Glenn, Tehama and Sacramento, and one member from each of the same counties from the Executive Committee of the convention of June 10th.

The supervisors selected were: G. O. Pates of Sacramento, E. T. Reynolds of Butte, S. H. Bradley of Yuba, W. M. Herd of Colusa, T. C. Snider of Yolo, and L. P. Farmer of Sutter.

Selections from unrepresented counties will be made hereafter.

From the Executive Committee the following were chosen: Wm. Johnston of Sacramento, E. Fagan of Butte, D. P. Durst of Yuba, A. H. Rose of Colusa, J. W. Snowball of Yolo, A. H. Wilson of Sutter, and W. H. Garrett of Solano.

E. Greer, chairman of the meeting of supervisors, was added to the list of members of the new association and was chosen president thereof. The association will meet in Marysville on September 22d, at 11 o'clock. It is understood that the finances of the association will be supplied by the counties in direct interest through the Boards of Supervisors. Robert Cosner was elected secretary of the association.

MINING AND SCIENTIFIC PRESS.

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO, SATURDAY, AUGUST 13, 1892

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Books—Henry Carey Baird & Co., Philadelphia.
Dividend Notice—Pacific Coast Borax Co.
Assessment Notice—Gover Mining Co.
Position Wanted—Box C, this office.

☞ *See Advertising Columns.*

Comment.

"The greatest mineral belt on the Pacific slope" is just at present in the White Hills, Arizona. It has been found in so many places, however, that it is difficult to keep located for any definite length of time. As far as amount of product and number of paying mines have anything to do with the matter, the greatest mineral belt in California is up around Grass Valley and Nevada City, Nevada county; at the Comstock, in the State of Nevada; at Tombstone, in Arizona; around Baker City, in Oregon; at Cœur d'Alene, Idaho; and at Butte, Montana.

On Wednesday of this week silver went to the lowest price per ounce that is known in the history of the world. In London the price was 38⅛ pence an ounce bar silver. Only once before has this price been approached, and that was on March 28th and 29th, when the quotation was 39 pence. In New York on Wednesday it sold at 83 cents per ounce. London produces no silver, and England produces none, yet the London market controls the world in silver. That great city fixes also the price of copper among other metals. Not many months ago when silver began to advance, the silver miners of this coast were in great hopes of a revival, but they were doomed to disappointment. It has steadily receded in price for some time. The result has been the closing of many mines, and more must inevitably follow, as at present prices there is no money in working any expensively operated silver properties. At present the United States is purchasing 4,500,000 ounces of silver a month and storing it. We have now in the United States Treasury 357,189,251 standard silver dollars, and only 56,779,484 in circulation. Besides this, there are in the Treasury 78,933,000 troy ounces of silver bullion purchased with silver or coin certificates. If this bullion was coined it would amount to $102,055,000, and it would take the Mints of this country nearly three years and a half to coin it into standard dollars. Meantime, silver is going down month by month, although we are withholding it, and despite the fact that it has other avenues of disappearance, as China, for instance, from which place the silver sent never comes back.

The members of the Mechanics' Institute who voted on the subject of purchasing a new library building or remodeling the old one, decided to stay where they are. The architect has reported that the walls are sufficiently strong to support the weight of an additional story. In conformity, therefore, with the almost unanimous wish of the members, the library will be maintained in its present location, and the additional room required for its growing needs will be provided in an additional story. It is contemplated to give up the second and third floors to library purposes, and put the reading-room and offices on the top floor. Even with these changes, there will be no very great amount of room to spare. At present the books are crowded on high shelves aud are hard to get at. This institution ought to be strong enough by this time to have its building entirely to itself, without the necessity of renting so large a space as it does to stores.

There has been a good deal of newspaper talk about Mars and important observations at the Lick Observatory, it being expected that certain scientific theories, especially those relating to the supposed canals, would be disproved. The fact is, however, that the observations at this opposition of Mars are not specially important in the northern hemisphere, and in the southern hemisphere, where the opportunities for observation are better, there are no large instruments. In this hemisphere the planet is too low for good observation, the angle being such as to necessitate looking through a great extent of atmosphere. At the time of the next opposition of Mars, in October, 1894, the observers in the northern hemisphere will have a much better view, since, while the planet will be somewhat farther off, it will be higher and in good position.

The collector of customs at San Diego has been worrying himself unnecessarily over the fact that considerable gold dust is coming into this State from Lower California, which is Mexican territory. He did not particularly object to the gold itself, but he was afraid something was coming in which ought to pay duty and did not. He apparently thought the McKinley bill charged high rates on everything, as the partisan papers convey that idea. However, the collector now feels relieved since Assistant Secretary Crounse says that gold dust is exempt from duty, and no consular invoice is required. The department is of opinion that no formal entry thereof should be required where it is brought in on the persons of passengers, but for the purpose of securing statistics of information they should be required to report to the inspector the amount of gold in their possession. Still, the Government departments find themselves unable to obtain correct statistics of gold produced in our own country, and may have also a hard task collecting statistics of imports of the metal.

The Blue Jacket mine, belonging to the Blythe estate, is an elephant on the hands of Administrator Pennie. It is comparatively worthless, but cost considerable money. A keeper in charge, who received $4 a day, has a claim of several thousand dollars against the estate for back salary, and threatens to bring suit. This mine is the only one ever favorably recommended by the late J. S. Phillips, M. E., who resided in this city many years. He examined many properties on this coast, but condemned them all but this one. The late Thos. A. Blythe, on Phillips' advice purchased the property and expended some $150,000 upon it. There never were any returns to speak of, and the failure of this mine was one of the things which led to Mr. Phillips leaving California. He told the writer of this paragraph that the Blue Jacket was the only mine he ever saw on this coast which fulfilled all the geological requirements of a perfect lode. But its geological perfection did not make it a paying proposition.

The result of the 52-mile ocean race between the steam-tugs Relief and Fearless must have been rather a disappointment to the mechanical engineers and ship-builders of the Union Iron Works of this city, since the large new tug built by them showed no excess of speed over an older and smaller vessel built in the East. Both vessels belong to the same firm—the J. D. Spreckels Bros. & Co. The Relief was built by the Cramps in Philadelphia, eleven years ago. She is 204 tons burden, 112 feet long, 22.5 feet wide and 12.6 feet deep. She is fitted with engines of 650 horse power. The Fearless, built by the Union Iron Works, is a new boat, much larger thanthe Relief. She is the largest and most powerful tug ever built in the United States. She is 150 feet long, 26 feet beam, and is driven by triple expansion engines of over 1300 horse power. The vessels were docked, cleaned, painted and prepared in every way for the race, specially good coal being selected for the bunkers. The racers went from the bay out into the ocean around the Middle Farallone island and back, a distance of 52 miles, and the big Fearless only won by two lengths, a very small margin considering the disparity in size of vessels and power of engines. It is true these towing vessels are given wheels for that purpose, not speed-wheels, but they are both equal in that respect. The Fearless has not, however, come up to the expectations in speed, having been built for a 16-knot boat, and not steaming over 14 at her best.

The Late W. H. Patton.

W. H. Patton, the distinguished mining and mechanical engineer, died at San Rafael on Saturday last from softening of the brain, after a long illness. Mr. Patton was 61 years of age. He came into prominence on the Comstock in 1864, after having spent many years in the mines of this State. He was engineer of the bonanza mines during their palmy days, and designed a great deal of the machinery on the great lode, including prominent mills, hoisting and pumping works, etc. In 1878 James G. Fair resigned his position as superintendent of the bonanza interests, and W. H. Patton was chosen to succeed him. How great the responsibilities of such a position were will be better understood when it is stated that Mr. Patton, acting in the capacity of superintendent, was called upon to direct the operations of the Con. Virginia, the Union, Ophir, Mexican and California mines. During Mr. Patton's superintendency, he devoted much of his energy to developing the facilities for deep-mining, and to him more than to any other man whose name has been identified with the mining interests of Nevada is due the state of perfection which deep-mining has reached on the Comstock lode.

In 1887 he was selected as manager of the Broken Hill Proprietary mines in Australia, the greatest silver mines of the world. There he introduced the American style of timbering, such as is in use on the Comstock, and designed suitable modern machinery. He revolutionized the systems in vogue there and put the mines on a good basis. He acquired mining interests of his own while in Australia, which made him a very rich man. His health, however, gave out, and two years or more ago, he had to retire from active work and come back to California. He never recovered from the overwork of the later years of his exceptionally active life. His name will be found as designer on some of the largest and most important mining and milling machinery ever constructed.

Electrical Work in Progress.

The local electrical engineers will be apt to have plenty to do if all the projects which are planned, calling for their skill, are carried out. In electric railway construction particularly, there is much going on in various parts of the coast. Interior towns are also paying much attention to electric lighting and numerous plants are being arranged. There is not so much being done in the way of furnishing electric power for mining purposes, but even that branch is not entirely neglected, Nevada and Mono counties both having projects of the kind in hand. The progress of electrical construction and installation on this coast must be very gratifying to those manufacturing electrical devices, and it is entirely probable that this branch of business will be largely increased in the future. We append some notes of work in progress and proposed in this State and elsewhere on the coast:

THE City Council of Tucson, Arizona, has adopted a resolution to enter into a two-years' contract for the electric lighting of the city with the person who will first put a plant in Tucson.

N. H. WHARTON has returned to Phoenix, A. T., from Chicago and will begin the construction of the electric railway before September 7th, the time of the expiration of the fraochise. Twenty-five thousand dollars was placed to his credit in the National Bank of Chicago by capitalists as a forfeit should they fail to begin work.

J. P. SMITH has purchased the stock of A. P. Hotaling in the Pacific Avenue Street R. R., Santa Cruz, which gives him controlling interest. Smith will probably transfer it to the Santa Cruz, Garfield Park and Capitola Electric Street Railway Company, and the motive power will be changed from horses to electricity. This road runs from the Pope House to the beach, and is the pioneer street railroad of Santa Cruz.

SUPERVISOR PELOUSE of Alameda county tells the Haywards *Journal* that the proposition of F. Chappalet & Co., to build an electric road from Haywards to San Jose had not died out, for Mr. Chappalet had informed him that he was not going to forfeit his franchise which will expire soon, but will lay enough track to hold it, and as soon as possible go to work building the road. The remarkable travel over the Haywards, San Leandro and Oakland electric road is sufficient to show Mr. Chappalet what is possible in Washington township.

THE Vandercook-Sessions electric road, from Eighth street and Broadway to East Oakland, will be in operation in 90 days from date. The powerhouse has been finished and contracts have been let for the equipment of the road aod the power machinery. The contract for cars has been let to Carter Brothers of Newark. The Risdon Iron Works has the contract for the power machinery, and the Thomson-Houston electric system and plant has been adopted for the operation of the road. All of these contracts provide that the plant furnished shall be completed and in running order within 90 days from date.

THE latest enterprise talked of in Sutter Creek, Amador, is the organization by four citizens, J. Dennis, R. C. Downs, M. Brinn and C. R. Downs, for the purpose of putting in electricity for lighting the town. The old Donnelly and Howard foundry ground has been bonded for the purpose, where the plant will be fixed. They

claim with the water facilities, pressure, etc., that light can be furnished at about the same expense as coal oil. What stock is not disposed of, if any, will be kept by the promoters and the capital furnished, so that the consummation of the enterprise is in a great measure assured.

THE Salem (Oregon) Motor Railway Co. is working on its new electric line and ties and poles are being delivered. The rails are 40 pound steel T rails. The Thomson-Houston motors have been ordered from Lynn, Mass. They will have fifteen horse power and will be the best made. One important point about them is that the grinding noise so common with motors will be done away with by having the gearing encased by an iron covering and so constructed that it will run in oil. By that means there will be no noise about the car except the rumbling of the wheels. The trucks will be the Brill, which are made at Pittsburg and are known as the standard. The present gauge of the track will be retained as that, after long service, has been found to be the most practical.

APPLICATIONS have been made to the Board of Trustees of the city of Alameda for two franchises for an electric street railroad, the applicants in both cases being the purchasers of the Meetz horse car franchise. The first franchise begins at the corner of Santa Clara avenue and St. Charles street, running through St. Charles to Kings avenue, to Morton street, to San Jose avenue, to Park street. The second, which will be joined to the first by the existing Meetz franchise on Park street, begins at the corner of Park street and Santa Clara avenue, running through Santa Clara to Versailles avenue, to Central avenue, to High street, and out High street to the northern line of the city. If this franchise be granted, as is believed will be the case, it will complete a system which will prove extremely convenient to nearly every part of the city. The petitioners for the franchise promise to make no delay in the construction of the road, and guarantee that the franchise is asked in earnest, and not merely as an obstacle to somebody else who might desire to build an electric road through the same territory.

ALF. TREGIDGO of Grass Valley tells the *Tidings* of that city that the company he has been organizing to furnish the mines of Nevada City and Grass Valley with electric power is about ready for business. The principal electric companies are already bidding for the contract to put in the dynamos. Mr. Tregidgo owns a valuable water right on the South Yuba river, which at the lowest stage carries 2500 miners' inches of water. A dam will be put in near the Purdon bridge, from whence a canal will be constructed on the south bank a distance of about four miles, where the dynamos will be stationed. A pressure of 400 feet will be gained by reason of the canal, and the water will be returned to the river. The canal's capacity will be 6000 inches, that it may meet the largest demands for power in the future. Mr. Tregidgo expects to make public, shortly, the complete details of this project, which is calculated to give mining a new and very material impetus. The dynamo station will be put three miles distant from Nevada City and seven miles from Grass Valley, hence the loss of power in transmission will be light. Right of way for the electric wires and the canal, and a site for the dynamo station, have been secured.

ARTHUR D. Thompson and W. A. Jacobs, representing Oakland capital have applied for a franchise for a new electric road in Sacramento. The route desired is as follows: Commencing at a point selected by the grantees on the Southern Pacific grounds near the south side of the passenger depot; thence in a southeast direction to a point near the intersection of Third and I streets; east along I to Seventh; thence on Seventh to Seventh and G; thence along G to the intersection of G and Twentieth; thence south on Twentieth to Twentieth and H; thence on H street to the intersection of H and Thirty-first; thence south on Thirty-first to the intersection of Thirty-first and N; thence west on N to the intersection of N and Seventh; thence north on Seventh to the intersection of Seventh and I, to connect with the line at I. Then beginning at the connection with the said line of railroad at the intersection of N and Seventh, running south on Seventh to the intersection of Seventh and T; thence east on T to the intersection of T and Thirty-first; thence north on Thirty-first to the intersection of Thirty-first and N, to a connection with the line on N. Then commencing on Sixteenth at the intersection of Sixteenth and G, running north on Sixteenth to the intersection of Sixteenth and the northern boundary line of the city. The rates to be charged shall not exceed five cents, and grantees shall pay an annual license of $5 on each car. If they get the franchise they propose to equip the road with all the latest appliances.

REDLANDS, San Bernardino county, is to have an electric light and power system, a franchise having been granted George H. Crafts, George B. Ellis, F. G. Ferand and H. H. Sinclair. It is designed to erect a plant that will, together with the land, cost $20,000, and the system to convey the electricity to and through the city will cost $40,000, a total of $60,000. There will be two six-inch Pelton water wheels,, and a sufficient fall can be secured to develop 800 horse power. W. Howard White, one of the ablest civil engineers in that part of the State, is in charge of the work and is in the field with a party making surveys, measurements, etc. It is the intention of the company to advance the work as fast as it can be done. It will require several months, however, to complete the plans, erect the buildings and get the machinery in place. Application has been made by a large manufacturing concern for power, with the view to starting a large factory between the city and the canyon. The new company ha acquired water rights on Mill creek for power purposes, and will not interfere with the rights of those using the water for domestic or irrigating purposes. One advantage to the owners of the water is the fact that by carrying the water for a distance of 10,000 feet through pipes, from 300 to 400 inches of water will be saved that is now lost by seepage, and the company will make no claim to the water thus saved. Here is a chance for another pipe contract.

Coast Industrial Notes.

A SIXTY-FIVE THOUSAND DOLLAR high school is to be erected at Redding this year; also a $25,000 Y. M. C. A. building.

THE Marin County Water Company is building another large distributing reservoir on the top of one of the hills behind San Rafael.

BUILDINGS for the Carlson-Currier silk factory in Petaluma, are nearly ready for the machinery, which will be all in place and in running order by the 1st of October.

D. W. EARL & CO. has been kept busy during the past two weeks putting the big freight wagons in repair in anticipation of an increase of business between Hawthorne and Bodie.

THE Palermo Land and Water Company and the Pacific Improvement Company have jointly contracted to build a $50,000 hotel at Palermo. A. Page Brown is the architect, and the structure will be a picturesque summer hotel.

OVER 100 people from Santa Rosa are employed by the Sebastopol Packing Company, and a special train is run between the two towns for their accommodation. The company is shipping from one to three carloads of fruit daily.

THE Comstock mining and milling company disbursed a total of $137,433 for labor for the month of July. Owing to the drafts of men from several of the mines, and the stoppage of some of the mills, the pay rolls next month will be smaller.

THE twenty million dollars in gold shipped by rail from San Francisco to New York has arrived safely at its destination. There were 500 boxes in all, each box weighing 150 pounds and worth $40,000. The entire weight in gold was 75,000 pounds.

ACCORDING to the latest advices by telegraph, coal freights from Europe and Australia are firm and slightly higher. Owners seem unwilling to accept charters even at the advanced rates, and manifest a disposition to hold for still better figures.

THE Sante Fe company is arranging with San Diego citizens to send out another "California on Wheels." A special car will be fitted up with an exhibition of southern California products and hauled through the East. It will start eastward on the 22d inst.

THE beet sugar factories of Watsonville and Alvarado will start up on the 20th inst., with double the capacity of last year. The Chino factory has been running for about a month, and is turning out 1000 sacks of sugar a day, which is three times the amount produced last year.

DURING the month of July, flasks of quicksilver were shipped from the mines of Napa, Lake and Sonoma counties as follows: Gt. Western, 600 flasks; Napa Consolidated, 425; Mirabel, 199; Sulphur Bank, 110; Baker, 2; total for July, 1336 flasks. The 1336 flasks are equal to 102,204 pounds of metal, having a value of $60,000.

DR. MAHONEY and his partners have let the contract for building their dam on the Agua Fria, Arizona. It will be one of the largest in that section and will place the Harqua Hala country in a position that both its mines and farms will have sufficient water. A large number of people are now locating land under the canal that will be taken out at the dam.

A TUNNEL 1140 feet long on the Fort Bragg Logging Railroad, Mendocino county, was completed on Tuesday, connecting Pudding creek with the Noyo river, where the Fort Bragg Redwood Company will carry on logging operations this season. The tunnel opens up a fine body of timber, miles in extent, where an ax has never been struck except for ties.

WORK has begun at Fresno on the Pine Ridge flume and several hundred laborers are on the ground. It is expected to build one mile per week. The flume will be the largest in California, although not the longest. It will be double; one part for floating lumber and the other part for carrying water for irrigation. By means of the flume it is expected to irrigate 40,000 acres of land northeast of Fresno.

THE property holders of Park street, Alameda, have finally decided that they will favor the bituminizing of Park street between the railroads, and they have prepared the plans and specifications that they prefer to be followed by the city trustees in ordering the work done. Of the 4000 feet of street, the owners of 3600 feet have signed the contract for the work to the Santa Cruz Paving Company.

A dispatch from Victoria, B. C., says: B. M. Rudy of the Vulcan Iron Works of San Francisco, arrived from the north several days ago, having just completed a cold storage system at Cunningham's cannery on the Skeena river, which is proving a big boom to the cannerymen, besides opening up a new phase of the fishing industry. When Rudy left Skeena 6000 salmon had already been frozen and were being prepared for shipment east. The fish, immediately upon being taken from the water, are put into a room where the temperature is 20 degrees below zero. They are left there six or seven hours, when they are removed to another and larger room, 30 degrees below the freezing point, where they are kept for a couple of weeks. They are then placed in hermetically sealed cases and are ready for shipment. It is claimed that they will keep for years and are just as good as fresh fish when opened. Other northern canneries are negotiating for the erection of similar plants, and it is expected that before long Easterners will be enabled to eat fresh Skeena river salmon in their homes. Besides opening up this new industry, coldstorage is also of great benefit to the canners in saving fish after a big run. For instance, while Rudy was up north there was an immense run of salmon on the Skeena and the canners could not handle the fish. Without coldstorage they would have had to stand on their docks and watch the fish running past their doors. With it they are able to take all the fish they can and put them in the coldstorage warehouse, where they will keep till they are able to use them.

Personal.

W. S. LYLE, the mining operator, has returned from a trip to Arizona.

PATRICK CROWTY, an old-time Pioche prospector, is at Kingman, Arizona.

J. H. NEFF, president of the California Miners' Association, is in Denver, Colo.

TIMOTHY KEEFE of this city is visiting the new camp of the White Hills, Arizona.

WILLIAM S. EDWARDS, who is interested in mining and other enterprises at Calico, is in the city.

W. T. JONES is superintendent and Jenkin Griffith foreman of the Bay State mine, near Plymouth, Amador Co.

O. F. KUENCER is on his way to St. Louis on business connected with his mining properties near Mineral Park, A. T.

PROF. ALPHEUS HYATT of Washington will hereafter be connected with the U. S. Geological Survey fieldwork in California.

D. H. JACKSON, superintendent of the Holmes mine, Nevada, is in town. He cannot say when the Holmes will resume work.

THOMAS POLLARD has resigned his place at the Talisman mine, Amador City, with the intention of moving his family to Los Angeles.

THE Democratic County Convention at Auburn has indorsed Assemblyman Dr. N. Martin of Placer as joint Senator with El Dorado county.

DR. T. BOYSON, a stockholder in the Kennedy mine, is up at Sutter Creek, Amador Co., from San Francisco, the guest of Senator E. C. Voorhies.

J. W. MUNN has a number of men at work on his mine in Music mountain, A. T., and is taking out some of the richest silver ore ever taken from that camp.

RICHARD L. OGDEN, formerly of this city, but now a resident of New York, is visiting California in connection with some mining operations in Tuolumoe county.

JAMES LOGAN has sold his mine near Fresno Crossing, Fresno county, to John D. Beam and others of this city for $5000. The mine will be put in operation at once.

E. H. DAVIS of Grass Valley, who came here from Australia in 1852 and has followed mining in Calaveras and Nevada counties, died near Grass Valley last week.

PROFESSORS BARNARD and Schaeberle, astronomers at the Lick Observatory, have had their salaries raised to $2400 per annum by the regents of the University of California.

CHAS. M. ROLKER, mining engineer, who accompanied Lord Randolph Churchill in his investigation of the mineral resources of Mashonaland, South Africa, has returned to New York.

ROSS E. BROWNE, who has recently been examining some mines in Wyoming, went, on his return, to Amador county on a mining examination. He came back to the city this week.

TOBIAS HOCKING, better known among miners as "Uncle Tobe," who worked for many years at the Bunker Hill mine, Amador City, died in England while on a visit to his native country.

JOHN MARTIN, an old pioneer of Trinity county and well known to many of the old timers in the State, died at Weaverville on Sunday a week ago. Mr. Martin was a very wealthy man. He was the brother of Henry Martin, the owner of the Brown Bear mine on Deadwood.

DR. POWERS of Sacramento and Mr. Sunderhaus of the Young America mine, Sierra county, have been at Gold Hill, Oregon, thoroughly prospecting recent discoveries in that section, and from the favorable showing thus far made, it is probable they will make investments in Rogue River valley.

PRESIDENT HARRISON has appointed T. R. Hofer superintendent of the U. S. Mint, at Carson to fill the vacancy caused by the death of Samuel Wright. Mr. Hofer was formerly chief clerk of the mint. The mint will be reopened as soon as his bond is confirmed, and no other changes of any importance will be made.

CAPTAIN CHESTER, Captain Brown and the eight miners who were supposed to be dead in Golovin bay were passengers on the steamer St. Paul to this city from Alaska. Captain Brown, who went up to Golovin bay prospecting, about a year ago, reports the gold mines of the Golovin bay region as phenomenally rich, and brought down three tons of good paying ore with him as samples.

JOHN B. PITCHFORD, mechanical engineer; H. B. Gale, professor of mechanical engineering at the Stanford University; and Lieut. John B. Finley of the U. S. Signal Service, each read papers at the last meeting of the Technical Society. Mr. Pitchford spoke of Corliss engines; Prof. Gale of hydraulic passenger elevators; and Lieut. Finley of the general circulation of the atmosphere, differing with the views of Marsden Manson, engineer of the Harbor Commission, who read a paper on the same subject at a previous meeting.

JAMES H. KINKEAD, superintendent of the Occidental mine on the Comstock, while carrying in his buggy $10,000 in coin to pay off the men, was stopped by a highwayman. Mr. Kinkead had a shotgun charged with buckshot across his knees, and replied to the demand by firing at the highwayman, the charge entering the latter's right arm and disabling him. After receiving the wound the highwayman ran and was pursued by Kinkead, who succeeded in capturing him after a race of half a mile, and brought him to town in his vehicle and and placed him in the custody of the Sheriff. While endeavoring to escape the highwayman discarded his rubber coat and mask, and Kinkead discovered on capturing him that he was an employe of the Occidental mill named William Hurd and aged 24 years. That rubber picked out the wrong man.

"Approved English Names for Western Trees."

Prof. Sargent's Criticisms Considered.

OAKLAND, July 30, 1892.

TO THE EDITOR:—Having kindly opened your columns from the first to the discussion upon the establishment of certain English names as being suitable for our western trees, I desire further to employ your valuable journal to report from time to time the progress of the new departure.

Returning recently from an extended reexploration of the forested mountains of Southern Arizona, we find awaiting us much interesting data concerning the proposed English names. I may say in general, that the reform movement seems to meet with almost unanimous support, which was not to be expected in certain quarters, where radical changes were proposed, and such approval is therefore all the more gratifying.

Where criticism or differences of opinion are given, it is generally offered in a considerate, kindly spirit, which is exceedingly helpful, and for which I am truly grateful.

The State Superintendents of Oregon and Washington write approvingly, and recommend that the Handbook (lately introducing these names) be placed in their school libraries, while most of the county superintendents of California receive the English names with favor, and several Eastern journals give extended notices of the Handbook, and encourage the preparation of the larger work to follow.

The most important indorsement of my efforts to establish suitable English names comes from Prof. Sargent, editor of *Garden and Forest*, for May 11, 1892. He gives a two-column editorial notice of the Handbook, quoting several paragraphs and giving nearly the full list of English names proposed for our Cone-bearing trees, "in the hope," he concludes, "of aiding the author to bring about a most desirable reform."

He also takes exception to a few of the proposed names, giving reasons therefor; and it is to these helpful criticisms that I wish particularly to refer at this time, for in most instances the exceptions are not well grounded, as I will endeavor to show.

"Alpine White-bark Pine" of the Handbook, designating in English our *Pinus albicaulis*, which we find with its white bark and its white annual branchlets fringing the upper limits of our alpine forests, he considers sufficiently designated by the shorter name of White-bark Pine; but all the trees of this order in high, wind-swept situations are apt to have more or less silvery white bark, whatever their color in less elevated localities. "White-stem Pine," alluding to the stout annual stems, would be a better name, and, moreover, it is a literal translation of the botanical one. This correction will appear in the next edition.

"Nevada Nut Pine" for *Pinus monophylla* he thinks not well chosen, because the species is not confined to the State of Nevada. To be sure, it extends to contiguous territory, but its headquarters of best development are in Nevada; and the same remark is true of the "New Mexican Piñon," which extends sparingly to adjoining regions, but is abundant in New Mexico. "Stone-seed Mexican Piñon" Prof. Sargent thinks "a rather unnecessarily long and awkward name." Awkward it certainly is, but exactly descriptive, and a similar name is necessary to distinguish this hard-seeded species from the two other soft-shelled piñones partly included in Arizona, though the "Stone-seed" is the principal one, and largely cultivated for food in Mexico, where it abounds.

"North Coast Scrub Pioe" for *Pinus contorta* he thinks might be changed to Contorted Pine. As neither the tree nor any of its parts are contorted (despite the fancy of Douglas, who named it), and considering that the tree is the smallest of our species and confined exclusively to the North Coast region, the preceding name was naturally suggested.

"Arizona Five-leaved Lumher Pine" is criticised as "an unfortunate designation, as the leaves are not always in 5's and the species does not produce especially valuable lumher." To this I have to say that the leaves—like those of other species—are usually constant in their number; and as to the other objection, this pine is one of those growing in the reach of the white man, and has been mostly cut away in certain localities and manufactured into lumber which is similar to the yellow pine of California, belonging to the same group—the "Broken-cone Lumber Pines."

"Canada Horn-cone Pine," for the curious little Canadian Pine, with its horn-like cones pointing forward along the branchlets, my critic thinks "not preferable or easier to remember than Gray Pine, hy which this species is universally known in Canada." But the horn-like cones of this species are unique in the great family of Cone bearers; the tree is not particularly gray in color, only "dull grayish green," according to Gordon, while we have agreed to call our gray, cloud-like *Pinus Sabiniana*, the "Gray-leaved Pine," which would conflict.

The approved names for our firs fare better, owing to the fact that "their identity and synonymy are more confused than the trees of any other group of conifers;" but "Feather-cone Red Fir" the editor thinks "inappropriate." Pray wherein? Its Latin name *Abies nobilis*, meaning Noble Fir, and so called hy some authors, is certainly inappropriate because the tree is less majestic than two other species, while the cones are clothed with recurved, heautifully fringed, hrown hracts, resembling the feathers of a bird—hence Feather-cone.

Concerning our redwoods, Prof. Sargent writes: "It hardly seems necessary to designate *Sequoia sempervirens* as the 'Coast Redwood,' as it is the only California conifer that is called Redwood; or to call *Sequoia gigantea* 'Giant Sequoia.' To our taste," he continues, "Big Tree is a simpler and hetter name." It happens that both Sequoias are decided Redwoods and both called Big Trees, hence some distinction is necessary. I thought to call one the Coast and the other the Sierra Redwood, hut "Giant Sequoia" is already in use and quite distinctive for the larger species.

"Alaska Ground Cypress" is objected to hecause "the tree sometimes attains a height of 100 feet, and it is by no means confined to Alaska." To this I have to remark that, compared with the other genera of cypresses, the trees of the genus *Chamæcyparis* are found with low, spreading branches, as the Latin name signifies, while Alaska is the principal home of this species.

"Arizona Red-bark Cypress" falls under criticism, "as it is the nnly species known to grow in that Territory, and so, simply Arizona Cypress would do as well." Late explorations in the Chirricahua mountains of Southern Arizona reveal, as we expected, that there may be two or three species of stringy-barked cypress, until the present unknown, in that Territory.

"Nor do we like 'North Coast Cypress' for *C. Goveniana*," writes our friendly critic, "as the species is found as far south as Monterey bay; or 'California Mountain Cypress' for *C. Macnabiana*, a rare and local species which grows on the foothills rather than on the mountains." I'm glad that the first-named cypress is admitted to be limited to the comparatively northern coast named, while the Mountain Cypress seems to have its headquarters, according to Mr. Carl Purdy, "on the top of Red mountain near Clear Lake;" also, according to Mr. Jeffrey, it was found by him "on the flanks of Mt. Shasta, at an elevation of 5000 feet."

I am glad to concede one exception as well taken: "Pacific Yew" of the Handbook is no better than Western Yew would have been; and, especially so, as Nuttall once called it *Taxus occidentalis*. This correction will be printed in future editions.

Lastly, Prof. Sargent alludes to my following the lead of Prof. Greene in taking up the name of *Tumion* of Rafinesque (not *Tuminon*, as twice printed in the *Garden and Forest* article) in the place nf *Torreya* of Arnott, and states that "the species in Florida is known by the vernacular name of *Torreya*."

Is it, indeed? Prof. Sargent's own census report of N. A. Forest Trees gives it as Stinking Cedar—one of the kind of names I am trying to get the public to discard.

A better name given the tree by other citizens is Nutmeg Tree. Only botanists would call it hy the Latin name of *Torreya*, a name commemorating one of the first botanists of America—Dr. John Torrey; hut, hallowed as is the name, when botanists learn that it is not available for this genus of Cone bearers, because it was previously applied to another genus, they must of course, however sorrowfully, take up the proper name, as I have done.

The editor of *Garden and Forest*, to whom I am indeed greatly indebted for his assistance in thus reestablishing on firmer grounds my proposed English names, concludes: "Such criticisms as those which we have ventured upon show the difficulty of fixing on any plant a vernacular name which will be acceptahle to every one, and will serve to emphasize the fact that the hest name for any plant is the Latin one which is given in accordance with a fixed and recognized principle and which cannot be changed except in accordance with that principle."

If the editor of *Garden and Forest* and other tree lovers will give the "Approved English Names" thoughtful attention, they will not find that I have entered upon this important innovation—which it must perforce appear to be in a few instances—without many years' examination of western forests and much careful comparison and halancing of appellations.

In this connection it should be mentioned that important discoveries have been made lately, concerning the conifers in the Territories of Arizona and New Mexico, but their discussion must be deferred to future articles, perhaps until the close of the exploring season, when time shall have been given for the examination of data and comparison of specimens. At present we can only pause to notice the evidences of approval nearly everywhere extended to the attempt to introduce appropriate vernacular names to the public, in the hope that they will he taken up by tree lovers and gradually estahlished, thus realizing the prophetic phrase of Sir Joseph D. Hooker: "Good English names for your noble western trees." J. G. LEMMON.

The Height of Douglass Firs.

Hon. Wm. Alvord of San Francisco, president of the American Forestry Association, was naturally put out a little by current newspaper statements that there are Douglass firs in Washington that are over 600 feet in height. Of course he did not believe it, and as will be seen hy the appended letter, one to whom he appealed for testimony, and who is an authority, says the statement is a great exaggeration. We are under ohligation to Mr. Alvord for the privilege of printing the following:

FRESNO, CAL., July 29, 1892.

William Harvey, Esq., Secretary Raisin Growers' Convention, Fresno, Cal.—DEAR SIR: I take pleasure in reporting to this convention that, pursuant to the call of the chairman, about 15 of the raisin packers of this county were together all of Monday last, in making minimum selling prices. For packed raisins, the f. o. b. prices finally agreed upon are as follows: Fancy layers, $2; 3 crown layers, $1.70; 2 crown layers, $1.50; fancy loose unfaced, $1.45; fancy loose faced, $1.50; 3 crown loose, hoxes, $1.35; 4 crown loose, sacked, 6½c; 3 crown loose, sacked, 5½c; 2 crown loose, sacked, 4c; seedless muscatel, 4½c.

These prices are based on 4½ cents for good raisins in the sweat hox. We have now the signatures of 22 packers, aggregating about 1,500,000 hoxes, and we have promise of several others that will sign the agreement adopted at the last State convention, and some have declined to sign it at all.

We are, however, hopeful that the required 95 per cent will be obtained, and to secure that desired end, a committee has been appointed consisting of G. B. Olufs, F. Romaine and G B. Nohle, to get such legal advice as may he necessary in drawing up a paper that will he hinding upon those packers who sign it.

It is further agreed that this committee shall either personally interview or correspond with those packers who have not yet signed the agreement, and ohtain from them their signatures, if possible, or in any event a definite statement of their attitude toward this movement.

I am, GEO. B. NOBLE, Chairman.

The New Silver Fields in Arizona.

WHITE HILLS, ARIZONA, Aug. 2, 1892.

TO THE EDITOR:—A short description of the new silver find at White Hills may interest such of your readers as have noted the recent sale of some of the leading prospects to San Francisco capitalists, for $200,000.

White Hills is north of Kingman, 50 miles, and the leads were discovered by Henry Schaefer in May last. The white hills from whence the camp is named, occur peculiarly in a range of black malapai, which is the country rock of this region. The hills are low, not more than hogbacks, running from the higher malapai hills to the Sacramento valley or rather desert. On the summit of each ridge extends a horse of porphyry, parallel to which, on each side, were found the broken ledges of wonderfully rich silver ore. All indications point toward a continuation of the ledges under the malapai debris of the valley. Old prospectors say that similar white hills are found among the malapai ranges all the way northward to Stone's Ferry on the Colorado, 35 miles from here. The intense heat now prevailing prevents prospectors from exploring the country, as animals succumb before water holes can be located.

Nothing whatever has heretofore been found in these barren ranges, which accounts for the easily-overlooked recent strike. The old road across the desert to Stone's Ferry and on to Pioche, passes within five miles and in sight of these hills. The surrounding country is desolate and barren of wood and water.

Over 60 claims have been located here, but outside of the 15 original discoveries nothing of a bonanza nature has been uncovered. Thirteen of the Schaefer claims were located in partnership with John P. Birnett and John L. Sullivan (not the Boston boy) and it is these claims which have just been sold. The sale is a proof of their remarkable richness when considered that none of them has a a hole dug over 30 feet. Following is a resume of each:

DEFIANCE.—South extension of the Garfield, 36 inches wide, all ledge matter assaying. A small batch at the Kingman sampling works milled 700 ounces.

GARFIELD.—The ledge is found broken on the surface 15 feet in width. It runs, at the east, into the G. A. R., making a tremendously strong lead, which can he traced hy bold croppings over 2000 feet. Ore milled $321 silver and $6.40 gold. All ore running less than $60 is left on the dump for the present, as freighting charges to Kingman preclude any profit. The shaft is down only 15 feet, where the pay streak is found 14 inches wide.

G. A. R.—This shows more rich ore than any mine in camp. The vein is over 35 feet wide on the surface, broken hadly and mixed with foreign matter. The shaft is down 25 feet. Rock running 1500 ounces is being sacked for shipment. Occasional streaks two and three inches wide are found, of pure horn silver and chloride.

CHIEF OF THE HILL.—Situated a mile north of the G. A. R., with no intervening float, this is the largest solid vein in camp. It has been already uncovered six feet without encountering the foot wall. Being in and across a wash, the ledge is partly covered with sediment, so that its extent is not yet known. Ore assayed over 2,500 ounces silver and some gold. Sulphurets are first found here.

OCCIDENT.—The little work done shows pay-streak three feet wide, the total width of ledge not yet discovered. The ore is of different character to those above described, owing to absence of manganese. Very rich in horn silver.

HORN SILVER.—Pay streak three feet, ledge full four feet. Shows more horn silver than any prospect. Shaft 20 feet.

The remaining seven locations—the Orient, Hillside, and others—are good, strong croppings, with no work done to speak of. Besides these, Judge Schaefer has the Norma and Treasure, individually, which are considered even richer than any of the partnership claims. Robert Patterson and partners have located the Prince Albert, Desert Prospect and other claims, which show the same character of rock and about the same richness.

Altogether, all mining men who have visited White Hills are astonished at the immense extent and richness of the strike. It is said to show more rich ore than Tombstone or Pioche in their Palmiest days.

The new purchasers have purchased a law-suit that has sprung up over the one-third interest sold by Sullivan to Wm. H. Lake and others over a bond he had previously executed in favor of Schaefer. This will probably delay the opening of this phenomenal camp, and hence it is advisable that miners and laborers looking for work should not yet come to White Hills. Prospectors, also, must wait for cooler weather and the rains before entering this region. A few months at most, however, it is confidently predicted, will show the extent of the present find and discover others that will attract the attention of the world to Arizona.

IRA E. BENNETT.

The Chick Process.

PITTSBURG, Kansas, July 28, 1892.

TO THE EDITOR:—Your issue of June 11, 1892, contains certain misstatements about the Chick process, and for your henefit I will give you some facts. In the first place, the Chick process was not discovered until the fall of 1889. The furnace and machinery used in the Chick process was not patented until 1891. The first plant huilt using the Chick process was built in 1891, and commenced operations in the fall of 1891, which has been continuous and successful ever since, as hundreds of its stockholders will testify, as they have received in dlvidends of $25,000, just one-half the cost of the plant.

The stock in this company at Pittsburg sold at $50 per share, but is now held and some little sold at $250 per share. This plant has just doubled its capacity, and is running night and day on dry hase and working some 99 per cent of its assay value without flux. A 50 ton plant using this process can work any base ore up to 99 per cent

of its assay value, at an expense not to exceed $2 per ton.

I enclose you a cut of the works now at Pittsburg, and should you visit the East, please call aod see for yourself the finest plant west of Chicago. There are six plants in course of construction now in different parts nf the United States that will use this process, and there will be one in California in the near future if the terms for California are complied with.

We challenge the world to show a process that will work the class of ore that we are now working up to 99 per cent of its assay value without flux. Yours truly,

G. HORATIO CHICK.

Electric Power for Mining in Nevada County.

The day is not far distant when electric power for mining purposes will be introduced into the Nevada and Grass Val'ey districts, says the Grass Valley *Union*. The plans for such an enterprise have been in formation for some time by Mr. Alf. Tregidgo, president of the County Miners' Association, who has acquired a valuable water right on the South Yuba, rights of way for a canal, and lines of electric wires, and the necessary stations for the dynamo plants. Several of the principal electrical companies have been bidding against each other for furnishing the dynamos, and there are men of capital who are desirous of he coming interested in the company that will undertake the the carrying out of the enterprise, as it is evident that it would soon be an important factor in furnishing power to run mining machioery in the districts named, and would be a valuable investment, as once the plant was established, the expense of maintaining it in efficiency would he comparatively light. The South Yuba river, at its lowest summer stage, furnishes 2500 inches of water, which will insure whatever water is required, and this will be conveyed by canal for a distance of about four miles, and then dropped to a station on the bank of the river, giving a pressure of 400 feet to drive the dynamos. This point would be only three miles north of Nevada City and only seven miles from Grass Valley, and therefore the loss of power by transmission would not be great. The advantage of the location of the entire plant would be that it is helow the snow line, and could not he obstructed by the snow fall at any time. Neither would there be any loss of water, as whatever was taken out of the river by the canal would be returned again. The location of the canal will be near the Purdon bridge on the South Yuba, and the canal will be constructed on the south side of the river. It will be made of sufficient capacity to carry 6000 inches of water, with a view to meeting the largest demands for power in the future for whatever purpose. The scheme is in all respects practicable, and can be carried into successful operation at a reasonable cost. The location is not surpassed by any in the State, and possesses the great advantage of furnishing ample power in a short distance for mining and other purposes. This valuable power has heretofore been running to waste, and its utilization cannot but exert a very beneficial influence on mining and other industries in the central portion of Nevada county. It is purposed to commence work on this valuahle improvement the present season. In a few weeks further details of the scheme will be made public.

As the vintage season for the year is nearly at hand, the wine makers of the State are again confronted with the question of storage room. They must sell their stock to make room for this season's wine or provide additional cooperage. The wine product was short last year and will be this; but the wholesale men do not want to pay figures which the makers consider fair. They are counting on the wine makers having to sell to make room for the new crop. The St. Helena *Star* (Napa Co.) says there is only one way to overcome this state of affairs. The problem of cheap storage has been solved, and is now in operation by several large wine makers. Instead of securing small cooperage to be lodged in large and costly edifices, therehy adding to the cost of the wines, they have hegun by obtaining cooperage at a low rate, the building heing an after consideration. They first order large tanks from 12 to 15 feet high and from 14 to 16 feet in diameter, capable of holding from 14,000 to 20,000 gallons each. These tanks are sent from San Francisco, carried to their destination and set up in place by competent men at a total cost to the purchaser of 1¼ to 1½ cents per gallon. When these tanks are set up in the place, they may be inclosed in a cheap frame building which will he sufficient for all purposes. Heretofore they were obliged to pay 2½ to 3 cents per gallon for the privilege of storing their wine in cooperage belonging to another man and in another man's cellar, together with the incidental expenses of drayage, gauging, watching, etc. By following the process mentioned, storage costs 1½ cents a gallon at a maximum for the first year, the wine is always under the maker's own supervision, and the cooperage is his own. When the San Francisco wholesaler sees that the wine makers are independent, and not obliged to rid themselves of their old stock to make room for new, he will be less disposed to treat them like beggars and impress upon their minds that without his good wishes they must starve.

THE Virginia *Chronicle* says: "The suspension of the ore product in the Yellow Jacket, Crown Point and Belcher mines does not constitute a complete shut-down of those mines, as many were inclined to consider. Official sources state it to be a temporary lay-off of the men employed in ore extraction for milling. About a dozen men are still employed underground in the Yellow Jacket, twice as many in the Cruwn Point and 20 in the Belcher, all engaged in prospecting and regular development work, and advantage is being taken of the situation to overhaul the machinery of the surface works and put things in proper shape after the long and incessant run of the last year or two. The present low stage of water in the Carson river gives the opportunity, therefore the mills also are similarly shut down and undergoing necessary repairs.

Cheap Power for Mills and Factories.

The great natural water power produced by the fall of Feather river at the Golden Feather dam, says the Oroville *Register*, will certainly be utilized in the next year or two if a transcontinental railroad is constructed through Beckwith Pass and down either fork of Feather river. This splendid natural power fnr manufacturing purposes will not lie idle and unused, for there is hardly a rival of such power in our whole State. At a narrow gorge in the Feather about two miles ahove Oroville, a high rock projects into the stream on the south side and a point of Table mountain on the north side. At this natnral site the Golden Feather Co. has constructed a strong and durahle dam built in the most permanent and lasting manner, to turn the water of the river into a gigantic masonry canal. The flow of water over this dam, or from the mouth of the canal back into the main stream, will afford a cheap and convenient water power for manufacturing purposes. Here mills and factories can be located, with ample room for yards and grounds, while the power for running machinery can readily be transmitted by electricity from the Golden Feather dam. The height of the dam is over 30 feet, and according to State Engineer Hall, the flow of water in midsummer in the Feather is 1200 cubic feet per second, which will give a vast power for the purposes indicated. During eight months of the year, or when the water is high, this power would be of course greatly increased. Manufacturing in other towns has built them up, caused an influx of capital, and added to their wealth and population. Manufacturing is to-day greatly needed in this State, for we have hitherto shipped our raw products and received in exchange the manufactured goods of Eastern towns and cities that have grown rich at our expense.

The water power created by the Golden Feather dam points out that Oroville is destined to become a noted manufacturing center. Cheap water power has created on other rivers great cities and huilt up extensive manufacturing establishments. In the vicinity of Oroville a vast quantity of fruit has been planted, and it is probable that within a few years extensive fruit canneries will he established at Oroville, Thermalito and Palermo. The day is not far off when the valuable beds of clay, of iron and coal will be opened and developed in this vicinity. It is probable that ramie will he grown upon the river hottoms and manufactured into various materials. The great forests that now cover the mountains along the Middle and North Fork of the Feather will be used in lumber, boxes, sash, doors, etc. This will give rise to extensive factories near where the cheap water power is created.

It is likely the day will come when tanneries and woolen mills will be in operation at this point, and with cheap and permanent water power for manufacturing, it is within the bounds of probability that Oroville within a dozen years will become a noted manufacturing center. This splendid water will not lie disused for any great time. The energetic manager of the company, Colonel Frank McLaughlin, is a clear-headed and shrewd business man. He is largely engaged in the planting of fruit, especially the orange and olive. Olive mills must be erected, and the power most cheaply obtained is that from the great dam of the Golden Feather. A hundred possibilities loom up before us, and all that is needed to draw hither capital and to establish manufactories is to make known the advantages that we have to present. The only way that this can be done is to thoroughly advertise our town and let others know what is open and apparent to us all in this vicinity.

One Way of Mining.

The Palmarejo Mining Co., Limited, may be cited as an example of how not to work a mine, says the *Arizona Herald*. The company owns mining property in western Chihuahua and was launched on the London market in 1886 by promoters who had made an unfavorable record in the Eherhardt mines of Nevada. These promoters received £200,000 cash and £100,000 of fully paid stock, of which the owner is said to have received less than $500,000. The mines were not new; they had been examined many times by American engineers, who had refused their purchase for less than $300,000. However, the English company was persuaded by the glowing report of its experts, not only to huy the mine, hut to suhscribe a working capital of £100,000. It was determined to build a mill, but when the ground was examined it was found that it would have to be located some 30 miles from the mine, where water could be obtained. This was apparently unexpected, and as the ore would not bear transportation expenses if carried on mules, the building of a railroad was suggested and £150,000 was suhscribed to the Mexican Mineral Railway, the Palmarejo Co. guaranteeing the new company 7 per cent interest on its bonds and an 8 per cent stock dividend. The railway was commenced, as was a water ditch, and the construction of a mill was resumed. Soon the latter was stopped for lack of funds, and the company had to issue debentures amounting ultimately to £150,000 before it could he completed. These were subscribed to by the stockholders, who were receiving favorable reports of the developments in the mine.

Finally the auspicious day came last April, when the railroad was completed, the mill built and the ditch ready for the water when, unfortunately for the patient English stockholders who had subscribed £600,000 in anticipation of success, there was enough water to run five stamps only, and of course, as funds are exhausted, there are further calls for money. The railroad itself was s complete failure, a fact that caused no surprise to any one who had seen it, for its grades were so heavy that it required two locomotives to haul one car of ore.

During this time the company had no less than three general managers and scores of suhordinates. The promoters claimed an average value of £30 per ton for the ore, which is just about double the estimates of many responsible experts. The prospects of the mine ever paying its dehts, or the stockholders ever getting anything, are extremely remote. If English investors in general would profit by this expensive lesson, it might he some satisfaction to those who had lost their money to feel that it was a philanthropical investment for the good of their fellow countrymen. Unfortunately, however, the crop of food is perennial and the supply is never exhausted. Or, to put it less brutally, the English investors in mines display an amount of blind, unquestioning faith which, if better directed, would surely secure the canonization of a large propurtion of Carlyle's "forty millions."

Southern Arizona as a Gold Producer.

So far in the history of the metallic output of Cochise, says the Tombstone *Epitaph*, gold has not cut a very conspicuous figure, not because it does not exist, but its development has not been fostered. Here in Tombstone a few million dollars' worth has been extracted, because it was found with the silver, and later in the history of the camp increased percentage with depth demonstrates that the output ot his metal will be immense. But aside from this camp,c ontiguous thereto we have specially defined gold belts that are certain to become great producers. The one that has received the most attention in the Dos Cabezas end of the Chiricahuas is a giant that gives sufficient showing to warrant the assertion that with a very much smaller outlay in plant and development than has been accorded the Father DeSmet group it would be a handsome and constant dividend payer. But it needs coin and plenty of it—enough at least to establish large mills eight or nine miles west of the mines where water is abundant, to he connected with a railroad, that the ores may be cheaply handled. Continuing down the range toward Sonora, gold ledges undeveloped can be found as far south as Silver creek. In the Antelope camp, adjacent to town, gold-bearing quartz can be found on almost every hill. A few prospect shafts have been sunk, but no special depth has been attained and crosscut prospecting for main depnsits is hardly shown. Speaking of this district, in the early days of our camp one of our citizens, desirous of opening up a claim he had, offered one-half interest for a 50-foot shaft on the property. The shaft was not sunk, but one party that examined the claim noticed three large granite boulders lying in a row on the surface. Breaking the crust of one of these it was brought in and found to assay $831 in gold. As this claim was close to the foothills of the Dragoons, and as the immense dyke that runs from Silver Cloud to South Pass, in view of town, gives colors on the surface, there is a field here that is well worth thorough prospecting.

To the south of Tombstone the Huachuca range, though long decried by many of limited knowledge as to its resources, is a perfect giant of a future producer. From the summit between Ash, Montezuma and Copper canyons, clear through to the reservation at the post, there is an almost unbroken belt of gold quartz. The "Sampson," in Copper canyon, owned by A. Barron and others, and now under bond for $50,000, at an elevation of 7000 feet, just under the pine belt, with wood and water in abundance, shows a ledge of from 4 to 6 feet in width, cropping up some places 30 feet above the ground, that on a careful estimate will average over $14 to the ton. This ledge is helieved to be the same that crosses the divide between Cave Creek canyon and Ramsey. There are a numher of gold claims in this helt that deserve special mention, not only for merit but for development under adverse circumstances of owners, but space will not permit. High-grade zinc, copper and lead ore have also been found in these mountains in strong ledges and deposits.

A PETITION is being circulated among the members of the San Francisco Stock Exchange in support of the resolution recently introduced in executive session to do away with the life assurance which the members' seats now carry. The movement meets with considerable opposition among the poorer class of brokers, who view it in the light of an attempt to depreciate the value of their seats. On the other side, it is argued that, owing to the fact that the fund is now depleted to the extent of one death payment, assessments would have to be levied to meet any further contingencies, all of which would have to he borne by the wealthier members. There are not so many of this class in the board just now, and besides, the present condition of business is not such as to warrant the expectation that the minority would feel inclined to pay more than their own pro rata of the amount required.

Reviewing the State as a whole, there are 40 counties out of a total of 54 that are engaged in preparing exhihits of their products for the World's Columbian Exposition that opens at Chicago on May 1, 1893. A few of the counties that are at work have not formed local World's Fair Associations, but such counties are included in one of the three district associations in the State, and the preparation of exhihits is in progress through other organized bodies or through prominent individuals. In 32 counties of the 40 there are regularly organized World's Fair Associations, and with but few exceptions the collecting and preparing of displays is proceeding systematically and with a satisfactory degree of rapidity.

M. W FOX, who was the plaintiff in the suit against the Hale & Norcross Mining Company, has notified the directors of the Savage Mining Company that he will agree to mill Savage ores for one year at $3.50 per ton. He requires that the ores shall be delivered at the mill he shall designate at the company's expense, and agrees to return in bullion not less than 65 per cent of the car-sample assays of all ores of not less value than $20 per ton.

THE Savage mine directors have appointed a committee to call upon the officers of the Chollar, Potosi and Hale & Norcross, and to invite the companies to join with the Savage in the purchase of a mill. The Hale & Norcross has declined, on the ground that it is not in a financial position to advance funds for such a purpose, and that all the available funds are necessary for exploration purposes.

MECHANICAL PROGRESS.

A Brief Fire-Engine History.

It was not until 1860 that steam fire engines came into general use, although floating fire engines had been used on the Thames for some years. In 1863 an account was published in the London *Times* of a competitive test between Englisb and American steam fire engines, prizes of £250 and £100 being offered for the best and secood best. The result was very much in favor of the old country engines, though the American ones certainly had many strokes of ill luck. Tbe Manhattan collided witb a tree and was badly damaged before it reached the competition grounds, and the other American engine, Alexander, broke its cylinder cover at the trial. If such a contest were arranged to-day, the odds would all be in favor of the machines built in this country, and no one would doubt this for a moment.

In principle all the fire engines are alike, whether worked by hand or steam. With the steam engine lies the advantage of continued action, much greater power and the supply of water at greater heights. No effort is made to economize steam in a fire engine. The main objects aimed at are the rapid generation of steam and its maintenance at a high pressure, ranging from 80 to 100 pounds to the square inch. A modern engine may be said to consist of three parts: A powerful coil of tubular upright boiler, the engine, pumps, air-chamber and the carriage. The greatest attention is paid to making the machinery very strong and very simple. Complicated valve gearing is not to be thought of. Every portion must be in a position where it can be easily reached and the parts must be such that they can be duplicated speedily. Ao average fire engine for use in a large city will have cylinders from six to eight inches in diameter and pumps from three and a half to four and a half inches in diameter, the stroke of both averaging about eight inches. All the larger engines are double, as, though each pump is double-acting, that is to say, delivers on both the up and down stroke, a steadier stream is supplied from double pumps.

The capacity of the largest engines is 800 gallons a minute; the average, though, is not over 600 gallons. The weight of an engine ranges from 7000 to 8000 pounds, and it will be understood that the very best and strongest workmanship is necessary to withstand the unavoidable rough usage incident to a hurried journey over vile pavements. The fire under the engine is lighted automatically, and as the water in the boiler is kept hot by coonection with sanitary boilers at the engine houses, the necessary pressure is attained in a few minutes at the utmost.

There are probably half a dozeo makes of fire engines in the United States, all of which rank as first class. It would be a very difficult matter to select the best, while to take the verdict of firemen would also amount to little, for men who have run all their lives with a particular kind of engine can see very little virtue in those of any other make. Some cities use almost exclusively one make of engine, and others are just as conservative in the use of aoother make.—Fire and Water.

How to File a Saw.

Every person should have a crosscut saw and a ripsaw, and should know how to file both. He will need a three-cornered file aod a couple of straight-edged boards, two or three inches wide and about the length of the saw, between which to clamp the saw in position firmly while being sharpened. The principle of sawing is the same as cutting. In ripping, the teeth act like a series of chisels, and should conform to a chisel shape as nearly as is consistent with the proper strength at the base of the tooth. The teeth of ripsaws are filed straight across the blade from every way, thus giving an entirely level and straight front to the tooth

The filing of crosscut saws is more difficult than ripsaws, at least to the amateur, as they are filed at an angle both horizontally and perpendicularly, and the set, or pitch, of the tooth must be governed by the hardness of the wood to be sawed. The softer the wood, the steeper the forward pitch of the tooth may be. In this form, the sides and base of the tooth are equally long. This gives the base of the tooth the strength to resist the pressure of the hardest woods. The hardness of the wood has also to do with the size of the teeth, as the harder the wood, the smaller the teeth must be in the same style of saw. The set of the tooth may be given fairly well, by a careful hand, by tapping each tooth with a hammer and punch as it lies flat on the end of a hard wood block, but it is best administered by one of the many good saw-sets in use. The width of the set is governed by the softness or sponginess of the wood. Elastic wood, such as willow, requires a very wide set. Give in no instance more set than is required to make the saw run easily, as all beyond this demands extra and useless effort, besides wasting the timber.—Farm and Home.

Rapid Transit.

It is estimated that a practical rapid transit system for the city of New York will require a carrying capacity of 150,000 passengers per hour io one direction. Louis Heilprin, a writer in the *Engineering Magazine*, says that the plans of the rapid transit commissioners are inadequate, and he points out that to adopt any other system than one which would give rapid transit would be only preparing tbe way for new complications in the future. Mr. Heilprin says: "This idea of compressing the traffic into a four-track main artery under Broadway for a distance of two miles and a balf is simply preposterous." Continuing, he says: "If eight underground tracks are needed above Fourteenth street, it is absurd to imagine that four will suffice for the remainder of the distance. But the idea of having only four tracks for these two and a half miles evidently has its root in the notion that the great underground thoroughfare ought to be, as far as possible, directly under Broad way. It is true tbat more than four parallel tracks cannot be located on the same level under Broadway without descending to a greater depth than the commission considers admissible. But is there any absolute necessity for locating the underground road precisely on the line of this thoroughfare? Better travel in comfort under the Bowery or South Fi'th avenue than be packed like herrings under the esthetic blocks of Broadway buildings. It might be well, indeed, for the east and west lines to converge somewhere in the vicinity of Union square, so as to meet in a capacious transfer station, which would permit passengers from the east side passing over to the west side and vice versa; but after thus meeting, the two roads ought to diverge again and pursue an independent course to the extremity of the island, from a quarter to an eighth of a mile on either side of Broadway." Mr. Heilprin is not an enthusiastic advocate of the underground plan, but seems to be convinced that it is the plan most liable to be adopted. This only adds to his desire to have real rapid transit, combining all the comforts of high-speed transportation and eliminating as far as possible the discomforts of travel through tunnels."

STEEL OR IRON TUBES.—At the Saratoga Convention of Master Mechanics' Association, a committee made the following report on steel vs. iron tubes: "The informatioo as to the relative merits of steel and iron for boiler tubes has excited considerable discussion, but your committee has very little definite information to present. We are, however, advised tbat in the case of a large number of steel tubes tbe results, so far as wear is concerned, have been unfavorable. The following definite experiment, however, bas been made: An engine was equipped with 114 iron tubes and 113 steel tubes on December 20, 1890. The iron tubes were placed on one side of the center and the steel tubes on the other side of the center of the boiler, the tubes being divided by a vertical line through the ceoter of the flue sheet. On March 9, 1892, the flues were all removed. Seventeen of the iron tubes were condemned on account of pitting and corrosion, while 64 of the steel tubes were condemned of the same defect. This would indicate that steel tubes are more affected by corrosion than iron ones. Further experiments and information in this line, however, are desirable in order to fully settle this question."

NEW LOCK NUT.—A new lock nut is being put upon the English market. It consists, says *Industries*, of a coiled spring made of steel of a suitable section so tbat the coils lie closely together. The interior of the coils is screwed to suit the bolt on which it is placed, and the exterior shaped to a square, hexagon or other convenieot form. The idea upon which the nut is based is the constant tendency which exists for tbe coil to press upon the threads with sufficient force to bind the nut firmly upon the bolt. Any pressure or jar upon the last two or three coils which are in contact with the surface to be fastened leads to an immediate locking of the nut which is very effectual. It is stated that the nut can be supplied at a low rate.

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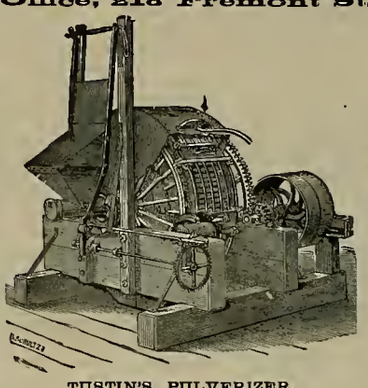
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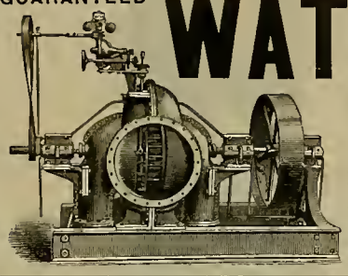

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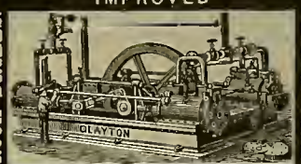

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Sponges.

Whether a sponge is to be classed as an animal or a vegetable is still a much disputed question. The sponges which you use do not seem to have much life in them, do they? And they certainly do not look much like any animal with which you are familiar. Yet these sponges are hatched from tiny eggs thrown off every spring by the parent sponge, and these atoms grow by and by to be big sponges like their mother. And although wise men have not quite agreed upon the subject, most of them have decided that sponges do belong to the lowest form of animal life, just one small step above the vegetable.

And these sponges are found of all sizes, from the small specks—the baby ones, you know—up to the huge fellows of three or four feet high. When the sponges are first batched, they spend a couple of days floating about in the water. Then they proceed to attach themselves to rock or shells, or any convenient place, where they hold on fast and grow bigger and bigger all the rest of their lives, or until some sponge fisher comes along with a big knife or a long fork and cuts or tears them from their resting-place.

Sponges are obtained in various ways, and in many different places in the world. Large quantities are found in the Mediterranean and the Red seas. Many are got in the Gulf of Mexico, and a long paper has been furnished lately to the State Department showing the great extent and value of the sponge trade of the Bahama islands.

In the Bahamas the sponge trade is an important industry. Very large numbers of people are employed in these islands in the work of gathering the sponges, handling them, clipping, washing and preparing them for market. From 5000 to 6000 persons are usually engaged, most of them, excepting the ship owners, brokers and shippers, being natives—black men.

Sponges are found either in shallow or deep water. In shallow water they are dragged off the rocks by a three-pronged fork with a long handle. The finest and most valuable sponges are found in deeper water, and divers go down to obtain them. The diver cuts them off from the rock carefully, being particular not to tear them. These are the most expensive sponges.

The amount of money made by the men who gather the sponges depends entirely upon the number they get. The work is very laborious, the prices paid are low, and the sponge gatherer who makes over $300 a year is a rare exception. The men who do the work on land of getting the sponges ready for market are paid about 50 to 75 cents per day, so it is not likely they amass a large fortune at the business.

Around these islands about 500 small vessels are employed in the trade. These vessels, being filled with the men who do the work, cruise about until they have gathered and prepared a good cargo of sponges.

The usual method employed in the Bahamas is by the fork or hook, such as is used in the East. At one time dredges were introduced, but their use has lately been discontinued. The dredge was found to break off and destroy the young and unsalable sponges, killing the spawn and working great mischief. These smaller sponges are never taken, but are allowed to remain and grow to a large size. An act was passed forbidding the use of dredges.

Great care is taken to protect the cultivation of sponges. The industry is of great value to the natives.

A sponge seems a little thing. It is like many another trifle, to which we have become so used that we no longer think of them as luxuries—more as necessities.

Yet their service to us involves the labor of thousands of people in far-away countries—people who supply their own needs and those of their families from their labor on these little things.—N. Y. World.

NICKEL AND FERRO-NICKEL.—According to a patent of Garnier, crude nickel, with basic flux of magnesia, calcined dolomite or chromic iron ore is melted in a water-jacket furnace with a hot blast. Silica and arsenic can be almost entirely removed by blowing air through the molten metal. For this purpose the tuyers are arranged in series one above the other. Then the remainder is so manipulated that the nickel alloy and slag run out simultaneously into a Gore's hearth, under the influence of the blast. The flux for refining iron or copper consists of coke and a mixture of 75 per cent bases (chalk, magnesia, and barytes) and 25 per cent feldspar or salt. The resulting alloy is free from nonmetallic elements. If nickel steel is required this alloy is remelted in a Siemens or Bessemer converter, or according to the crucible method. Pure nickel is prepared from the iron alloy by strong oxidizing action in a charcoal refining furnace or upon an open hearth furnace. Converters can also be used for this purpose. After the last traces of iron are blown out, the nickel always contains oxygen, which must be removed by the reducing action of manganese, magnesium, aluminium or zinc, added in the form of nickel alloy.

METRIC SYSTEM.—The New Decimal Association, whose headquarters are at Botolph House, Eastcheap, says the *London Daily Graphic*, has memorialized the Lords of the Committee of Council on Education on the desirability of taking an important step in connection with the introduction of the metric system in this country. The May examinations of the Science and Art Department are known through the length and breadth of the land, and much has been done by means of these examinations to popularize and extend technical study. The memorial which has been presented recommends that in certain of the science examinations alternative questions be given in future, based on the metric system of measurement, which may be taken at the option of the candidate in lieu of questions based on feet and inches. In this way the large and intelligent class of candidates for certificates of the department will be induced to learn the metric system. The Committee of Council on Education has already ordered that the principles of this system should be taught in the higher standards of all elementary schools; and one of the steps taken by the school boards of London and other towns, in consequence of this order, has been to furnish the pupil teachers and advanced scholars with boxwood rules having a decimalized inch scale and a metric scale in juxtaposition. In addition to this, colored wall-charts of the metric weights and measures are used, and in this way the rising generation will, to a great extent, be prepared for the introduction of these weights and measnres in future.

PREVENTING COAL DUST EXPLOSIONS.—In some of the German mines a new method has been successfully introduced for preventing coal dust explosions, in place of the usual practice of sprinkling water in dusty parts of the mine, this plan having only a limited utility, as the dust is generated by the breaking down of coal, and explosions may arise from the liberation of gases at the same instant. To meet these circumstances, the use of water has had an entirely new application, and with a result remarkably satisfactory. Holes of 1 metre deep are drilled at a distance from each other of about 3 meters, wooden plugs are inserted, and through them iron pipes from ¾ to 1 meter long, with openings between 2½ and 3 millimeters large, and connected with a rubber hose. It appears that in the Camphausen colliery a pressure of from 8 to 10 atmospheres and injection through two tubes in eight hours proved sufficient to impregnate 6 by 1 by 1½ meters, and in another case, that of the Kreuzgraben colliery, the water forced in under a pressure of 20 atmospheres during 16 hours moistened thoroughly the coal as far as four meters above the highest hole. In carrying out this method, primary regard is to be paid to the water pressure obtainable, the quantity of water injected and the firmness of the seam, the latter depending somewhat on the size of the coal pillars in the workings.

ALUMINIUM YACHTS.—The use of aluminium in the construction of sailing yachts offers, a naval authority considers, great advantages over the employment of wood and iron. Boats built of aluminium possess, he says, considerably greater stability than those constructed of the usual materials. He especially recommends the metal where vessels of fine lines and light draught, development great speed, are required. Estimating the price of a wooden or iron yacht of ten tons at £420, the same vessel. built of aluminium, would, this authority calculates, cost about £1,050. But the hull of the last named boat would, be argues, be as good as ever at the end of ten years, while the constructive materials of the wooden or iron vessel would be much deteriorated. Besides, he concludes, as time proceeds the price of aluminium will doubtless suffer by no means unimportant reductions.

AN English firm has invented an ingenious device for turning on the currents for electric lamps at a certain hour. An ordinary clock is so adjusted that at the desired moment a spring is released, permitting a pair of pivoted contacts to fall into mercury cups, thus completing the circuit.

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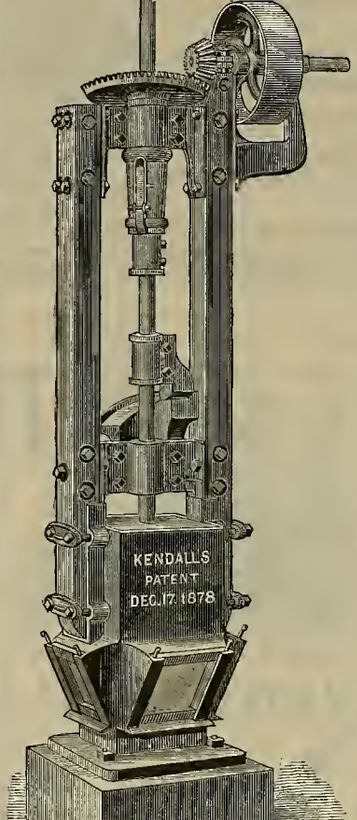

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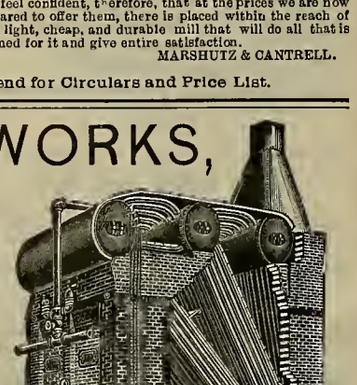

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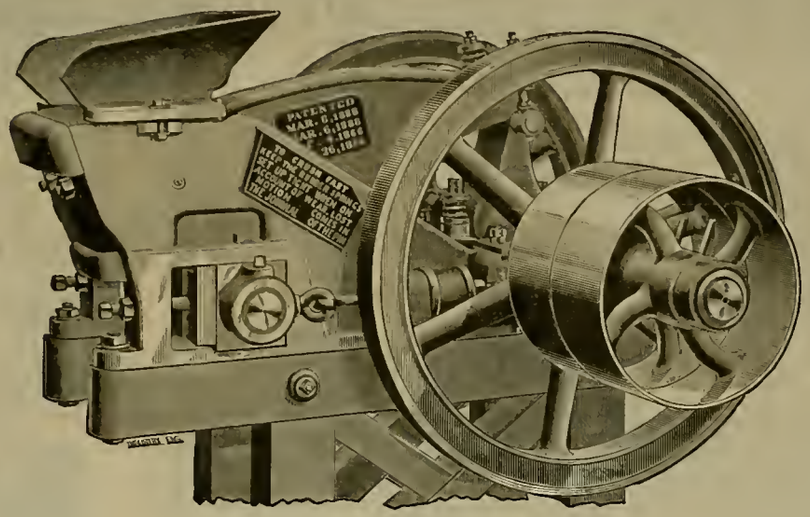

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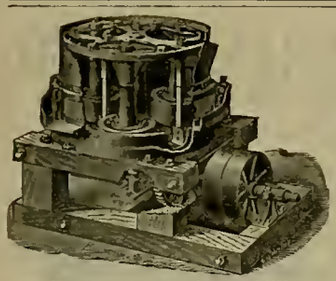

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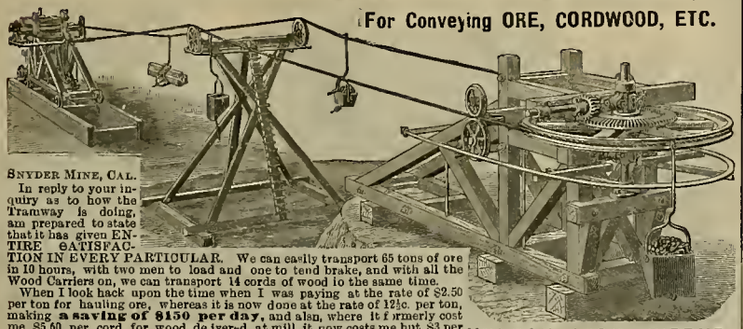

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Electrical Development.

We of to-day are very apt to think that whatever of advancement and progress has beeo made is due to our own inventive ability, but as a matter of fact, there are very few of the inventions of the present time that can be called new, except in the details of their construction and use. The development of electricity began centuries ago, its adaptation to mechanical uses being the only part for which we can claim any credit, says the *Manufacturers' Gazette*.

Electricity has always existed since the beginning of time, and can only be considered as in the light of a discovery, invention being only applicable to the uses to which it has been put in connection with mechanical and other devices.

Neither are we able to trace it to the original discoverer or his time, which may have been and probably was many years before the time of which we have any authentic history on these subjects; but the first man of whom history tells in connection with its discovery was Thales, about the year 600 B. C., who first relates of the action of of amber when rubbed, in showing the properties of electricity as known at the present time. Thales made many experiments, and began the development, which was followed up by Theophrastus, 321 B. C., and Pliny, 70 B. C., each of whom succeeded in still further developing its properties, and they speak of the power of rubbed amber to attract dry leaves and straw. In following up the subject, they also found other objects possessing the same powers. Among these were tourmaline and the torpedo. Both Plioy and Aristotle speak of the power of the torpedo on animal matter, and of the effects by contact with it.

This power was knowo to the ancients, a proof of which is given in the fact that there are accounts of wonderful cures effected by this agency. Anthero, a freedman of Tiberius, was cured of the gout by contact with and shocks received from the torpedo, and there are many other instances in ancieot history of a similar nature.

Malineer, king of the Greeks, seems to have been a wonderful character, and if alive at the present time would be considered quite in the line of a "curiosity," as he was able to emit sparks of electricity from his body.

We believe that Dr. Gilbert of Colchester is acknowledged as being the founder of the science, he having made it a study, and experimented with different substances to determine if they possessed the same properties. He wrote several treatises upon the subject, and did much to bring it more prominently into notice, and to lay the foundations for further developments.

Robert Boyle was another of the earlier experimenters and workers upon this subject, who assisted extensively in developing this active agent and applying it to man's usefulness.

It is impossible in so brief a space to mention all the wonders accomplished, in the experiments made with this force, or even to trace many of them to their originators, as, for instance, the first discovery or production of the mariner's compass, dating back over 2000 years B. C., and having its origin probably among the Chinese.

Coming down to the time of Galvani and Sir Humphrey Davy io the 18th century, we find more correct accounts, and how it was more generally understood. Between Galvani and his friend Volta the discovery of a new element in electricity was made and developed, each of whom gave their names to their discoveries, by which they are known to-day.

Sir Humphrey Davy was undoubtedly the first to attempt lighting by electricity. By the aid of 2000 Voltaic cells, he succeeded in producing a light. The excitement and strain upon his mind caused by this and other successful achievements, is said to have thrown him into a fever, which came near proving fatal.

The scientific men of those times had, by experiments, arrived at the conclusion that there was some connection between magnetism and electricity, and this missing link was at last discovered by the son of a Danish apothecary by the name of Oersted, and on this discovery rests the entire theory of electro-dynamics. This opened up a new source for experiments and inventions.

The discovery of the lines of force surrounding magnetic bodies was made by Michael Faraday, an English blacksmith. This was the greatest discovery yet made, and on this discovery rested the theory of dynamical electric machines. Faraday brought out many new ideas and made for himself a lasting name.

This brings us down to the time, since which most of us are familiar with the wonderful developments of the past few years, and the various devices which have been made to utilize this powerful agent.

There has been no discovery ever made which has developed into such magnitude, or proved more successful than that of electricity, and yet it is apparently only in its infancy so far as what it is capable of, as every-day results show, and we may yet live to see it the great motive, lighting, heating and mechanical agent of the world.

High Speed Train Resistance.

The subject of increasing the speed of railroad trains by using rotary electric motors in place of the present reciprocating steam motors, which is daily growiog to be more and more important, involves a koowledge of the train resistance at such high speeds. As theory is of little aid, we have to depend almost entirely on existiog experimental data, which, however, is unfortunately very scarce and not free from errors. In order to arrive at a good mean result for use in such calculations, our contemporary, *Engineering News*, in an able article compiles all the best existing data, makes some corrections and then plots them. From this set of plotted results a general law is then deduced by giving more or less weight to the various data, in proportion to their probable correctness. By this process, which is the only proper way to attack this problem, is obtained what is probably the nearest approach to the true rate of train resistance in pounds per ton that existing data enable one to deduce. The result, therefore, is of considerable interest to those working in this field, especially as it shows that the generally accepted assumption which states that the resistance iocreases with the square of the velocity, is probably incorrect. For steam locomotives, to which this article refers, there is a factor which enters ioto this total resistance, namely, the resistance due to oscillations and concussions, which certainly is quite considerable at high speeds, and if included in the total train resistance would doubtless make it increase more rapidly with the speed. But for electrical traction, in which there is only rotary motion, this factor in the total resistance becomes very much smaller, because a steam locomotive expends much energy in trying continually to get off the track, to spread the rails, to pound down the roadbed and to twist its frame. Although not pointed out in the article of our contemporary, yet it appears to us that the formulæ for electrical traction ought therefore to give lower results at high speeds than those for steam engine traction. The relative positions of the plotted values obtained for steam traction and those of Crosby made with electrical motors, seem to show this, as the latter form the extreme on one side of the mean. The results arrived at in this article, which refers to reciprocating steam motors rather than to electrical rotary motors, are that the train resistance is equal to one-quarter of the velocity plus two. This is certainly a very simple formula, and it would be very gratifying to find that it was correct. Further developments io this field may give different results, but until other experiments are made this formula may doubtless be used as the best one existihg at present.—Electrical World.

TANNING.—The application of electricty to tanning on a commercial scale is reported to be making quite extensive progress says the *Engineering News*. Although often spoken of as tanning by electricity, it is really tanning with electricity. The tanning process consists in a chemical union between the tannic acid from the bark, or other tanning agent, aod the gelatine of the hide. As ordinarily carried out the process is a slow one, requiring from a few weeks to a year, or more, for the proper treatment of the skins. The application of the electric current is claimed to greatly expedite the process, so that two to four days suffice to complete the tanning after the skins are made ready for action by the tanning liquor. Various theories are proposed to account for the action of the electric current in this case, but the well known effect of the current in inducing chemical action is sufficient to show that the process has really a scientific basis.

THE generators that George Westinghouse is building to furnish electricity for the 93,000 incandescent lamps at the World's Fair are to be among the largest in the world. One of them will operate 20,000 lamps. "The ordinary generator supplies but 1,200 lamps," Mr. Westinghouse said, "and most of them less. Our largest generator will supply 20,000 lamps, and most of the others will be of 10,000 lamp capacity each."

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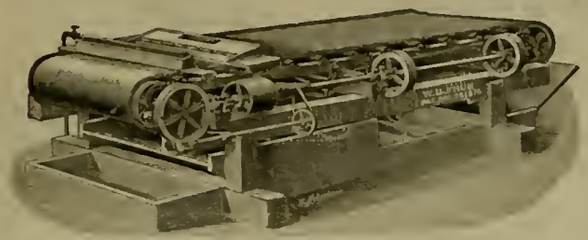

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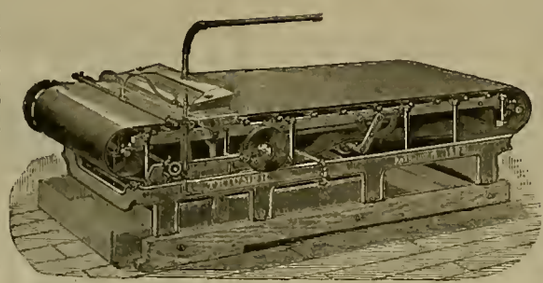
The competitive trials which have been held between the Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if used be. Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, Jr.,

Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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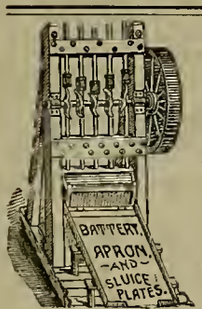

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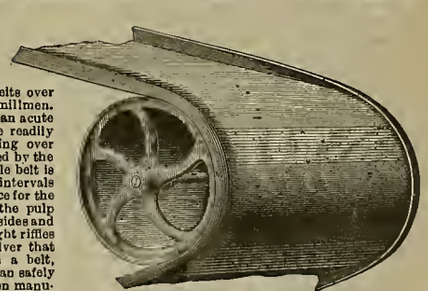

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GOOD HEALTH.

Exercise.

Much of the food actually digested and assimilated is not used to the fullest extent, for want of sufficient oxidization to make it yield the greatest amount of vitalizing power to the tissues of the body. Such partially unoxidized products have an irritating effect on the organs and tissues, and predispose them to disease, if they do not directly affect them with it.

Exercise has a stimulating effect on all parts of the body by inducing further oxidation in all the tissues and organs. This increased oxidation is attended by a greater demand upon the part of the system for oxygen, as indicated by the greater number, force and frequency of the respirations.

During exercise the heart beats faster, and forces more blood through the lungs to all parts of the body, bearing in its little blood cells the precious life-giving factor, oxygen. These little cells, one constituent of which, *hæmoglobin*, has the wonderful faculty of quickly loading and unloading itself with oxygen—thus act as direct aids to the process of oxidation in the tissues and organs.

It is the combining of oxygen with unoxidized products in the blood that gives to each individual cell its possibility of sustaining life. Any process which increases the oxygen supplied to all parts of the body tends to strengthen the life in each individual cell, and to give it more power to resist disease.

Exercise, of all factors, does this most effectively; and besides actually producing in each individual cell a greater vitality, it gives a favorable opportunity for the waste products of the tissue to be thrown off rapidly. But thus causing a further oxidizing of certain matter in the blood, it conduces in a double sense to life and health.

Habitual outdoor exercise, with suitable protection from extremes of weather, is the most effectual means of prolonging life to old age.

In this age of rush and hurry, when time is too precious to use for systematic exercise, and when the cultivation of the brain too often debars the remainder of the body from a complete development, it is not to be wondered at that the body succumbs to diseases which overtake it in its prime, because it has not the vitality to resist their inroads.

Our legal authorities would confer countless blessings upon "millions yet unborn" if they would pay more attention to increasing the number of public parks and places conducive to indulgence in outdoor sports.—Youths' Companion.

Tooth Culture.

In a capital address on "tooth culture," delivered at the annual meeting of the Eastern Counties Branch of the British Dental Association, and printed in *Lancet*, Sir James Crichton-Browne referred to a change which has taken place in bread, as one of the causes of the increase of dental caries. So far as England is concerned, this is essentially an age of white bread and fine flour, and it is an age therefore in which we are no longer partaking, to anything like the same amount that our ancestors did, of the bran or husky parts of wheat, and so are deprived to a large degree of a chemical element which they contain—namely, fluorine. The late Dr. George Wilson showed that fluorine is more widely distributed in nature than was before his time supposed, but still, as he pointed out, it is but sparingly present where it does occur and the only channels by which it can apparently find its way into the animal economy are through the siliceous stems of grasses and outer husks of grain, in which it exists in comparative abundance. Analysis has proved that the enamel of the teeth contains more fluorine, in the form of fluoride of calcium, than any other part of the body, and fluorine might, indeed, be regarded as the characteristic chemical constituent of this structure, the hardest of all animal tissue, and containing 95 5 per cent of salts, against 75 per cent in the dentine. As this is so, it is clear that a supply of fluorine, while the development of the teeth is progressing, is essential to the proper formation of the enamel, and that any deficiency in this respect must result in thin and inferior enamel. Sir James Crichton-Browne thinks it well worthy of consideration whether the reintroduction into our diet of a supply of fluorine in some suitable natural form—and what form, he asks, can be more suitable than that in which it exists in the pellicles of our grain stuff.?—might not do something to fortify the teeth of the next generation.

USEFUL INFORMATION.

ALUMINIUM FOR ARMY USES.—A French magazine contains a paper on this metal, giving the results of some fresh experiments which have been made in France in order to test the assertions of certain German chemists. The French claim aluminium as a national metal, and state that it is fitted, by its strength and lightness, to supersede other metals for numerous purposes; but chemists on the other side of the Rhine have thought less highly of it, saying, among other things, that it impregnated the liquids with which it came into contact. The writer in this review is perfectly satisfied with the new experiments. They prove that water, wine, beer, cider, coffee, milk, etc., are less affected by it than are the ordinary metals, such as iron, copper, zinc, etc. Vinegar and sea-water act on it to an ascertained extent, but not sufficiently to interfere with its use. The War Ministry is in the best position to profit by it, not only on account of its capacity to produce electricity, but of its extreme lightness and power of resisting the influence of the atmosphere. It is invaluable in the messing of troops, in the preserving of provisions, for ambulance purposes, for telegraphs, and for the many items, such as scabbards, canteen-badges and buttons, which by being lightened, would permit the soldier to carry more cartridges.

HOUSES OF GLASS.—While transparent glass brick have been employed for some time in walls of buildings to afford light at places where a window would interfere with the architectnral plan, this material has not been used to any extent for general construction purposes. It is now proposed to cast the glass, not necessarily transparent, into large blocks for buildings. As it is practically indestructible, nonabsorbent, and therefore damp-proof, it is expected by this means to furnish coarse glass in suitable shape as cheaply as concrete or stone. A plan has also been put into practice by which broken glass of various colors is mixed up, placed in molds lined with silica, talc, or other resisting material, and fired. The result is a firmly coherent mass, which can be dressed and cut into blocks. These are, of course, irregularly colored and may be employed in place of artificial marble. If decorative effects are desired, designs in relief can be obtained by pressure while the block or slab is still plastic.—Boston Journal of Commerce.

IT is not generally known that the light of the sun and the moon exercise a deleterious effect on edge tools. Knives, drills, scythes and sickles assume a blue color if they are exposed for some length of time to the light and heat of the sun; the sharp edge disappears and the tool is rendered absolutely useless until it is retempered. Purchasers should therefore be on their guard against buying tools from retail dealers and peddlers, which for show purposes have probably been exposed for days together to the glare of the sun. The unserviceableness of tools acquired under these conditions is generally wrongly attributed to had material or to interior workmanship. A similar prejudicial effect has been exercised by moonlight. An ordinary crosscut saw is asserted to have been put out of shape in a single night by exposure to the moon.

A GERMAN firm is bringing out a new type of electric mining lamp which differs in arrangement from the customary form, and which outwardly looks like the ordinary oil safety lamp. The accumulator is carried in a box having greater depth than length or width, and the glow lamp projects upward from the top of this, being surrounded by a glass cylinder surmounted by an iron plate, to which is attached the hook whereby the lamp is carried or suspended. The lamp weighs about 4.2 pound, and gives a light of seven to eight candle power for from ten to twelve hours.

A KIND of seaweed which is plentiful on the coast of China furnishes an admirable glue and varnish. When dried it is waterproof and it is employed to fill up the interstices in bamboo network, of which windows are frequently constructed in that country. It is also utilized to strengthen and varnish paper lanterns.

THE system of road-making known as macadamizing was invented by Mr. John Macadam and published by him in an essay in 1819, having practiced it in Ayrshire. He prescribed stones to be broken into six ounces weight, and the use of clean flints and granite clippings.

Educational.

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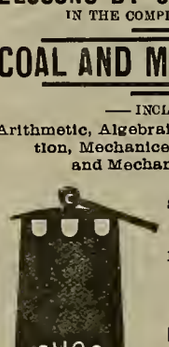
— INCLUDING —
Arithmetic, Algebraic Signs, Mine Ventilation, Mechanics, Mine Surveying and Mechanical Drawing.



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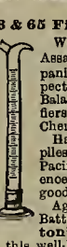
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MINING SUMMARY.

The following is mostly condensed from journals published in the interior. In proximity to the mines mentioned

CALIFORNIA.

Amador.

SUTTER CREEK.—Amador *Ledger*, Aug. 6: Cheering news is at hand of the South Eureka, being one of the mines of Amador county, and not a mere prospect. On striking the wall in the east crosscut a small vein about four inches thick was found, with the absence of any sign of gold. This was somewhat discouraging, but they kept it to themselves and made up their minds to drift north on the vein, which soon began to increase in size, till it has developed to about five feet in thickness and, the best of all, prospects $10 or $12 per ton. This makes the stockholders jubilant and one has already remarked that he would refuse an offer of $20,000. The local stockholders are J. Dennis, J. F. Parks, J. McIntire and Dr. J. L. Mayou. They intend to continue drifting, and as soon as that level is sufficiently explored, in all probability sinking will be in order again. [We sincerely hope our correspondent's figures as to the quality of the ore may prove correct. They do not, however, tally with the statement, based on actual assays, given us from headquarters. While the quartz at present met with may be nonpaying, there is no reason to feel discouraged. The main fact remains—a strong ore body has been met with and it is out of joint with the general character of veins on the mother lode, if it does not lead to pay rock. —Ed.] Taking water out of the Hector is about through for the present. They are below the 700-foot level now, where water will be kept, while levels are being opened up between the 200 and 600 foot levels. At the earliest opportunity the mill will be started. A new track is being put in the shaft, which is necessary for steady work. At the Wildman everything is running full force, and there is nothing new to report. Exploring at the Belmont is being pushed with all possible speed, and sinking will likely be brought to a halt soon. Attention will be directed to the opening up and taking out of ore. After a rest of two weeks for repairs, the sulphurets works have resumed operations again.

BAY STATE.—Amador *Ledger*, Aug. 6: The vein discovered on this claim had widened out in the early part of the week to five feet on one side and three or four feet on the other, and still widening. The ore is of low grade, estimated to mill $5 or $6 per ton. With a strong ledge, this can be made to pay handsomely. The stockholders are naturally greatly enthused over the prospects, and the population of Plymouth generally shares in the expectations of better times as the outcome of the successful opening up of this mine. Quite a number of Plymouth folks—stockholders and others—visited the mine last Sunday.

SOUTH EUREKA.—The drifting operations at this mine encountered a body of ore last Friday, and by Sunday the ledge was disclosed to the width of several feet. The quartz is of a dark character, mixed with considerable slate. Some pieces were taken out showing free gold. All the ore seemed to be plentifully charged with sulphurets of a dark color, and somewhat different from any found elsewhere on the main belt. To all appearances, it was of good grade, and indeed expert miners who saw the ore never doubted that it would surrender the precious metal in paying quantities. It is very disappointing to have to report otherwise. Samples of the ore have been assayed at the Kennedy, and the highest yield obtained was $2.50 per ton down to as low as $1.25. Mr. Parks was as fully satisfied of the pay nature of the quartz as any one on first sight, and was very much surprised at the poor showing. The ore shoot seems to extend upward and downward. Barren places are met with even in the best gold-bearing ledges of the mother lode, and it is probable that one of these nonproductive spots has been struck in the South Eureka. The result of further exploration will be awaited with much interest.

AMADOR GOLD MINE.—The affairs of this property seem to be as far from settlement as ever. The report that the English and American stockholders had agreed upon a basis of settlement of their differences appears to have been premature. At any rate, it is now said that no agreement has been reached, and the prospect is that the courts will have to arbitrate the differences between the two factions. This means an indefinite prolongation of the present idleness of the property.

MISCELLANEOUS.—The shaft track and timbers are being taken out of the Plymouth Consmine, which looks like the complete abandonment of this celebrated property. W. T. Jones reports that the Bay State gives every promise of a solid mine. The ore shoot has been followed 75 feet.

Butte.

IN GRANITE BASIN.—Oroville *Mercury*, Aug. 3: Jo. Peppin of Granite Basin came down last night with 11 ounces of gold taken from a quartz mine. About five years ago he bought the property for taxes and it was not redeemed. He drove away at the mine until he developed a rich ledge and the ex-owners—San Franciscans—instituted suit to recover the property. The contest has been going on four years, until recently, when a compromise was effected whereby they agreed to work the mine in partnership. They intend now to put up a good mill and work the mine thoroughly. Mr. Peppin says the rock he has crushed yielded an average of $15 to the ton, free gold.

A RICH LEDGE.—Jas. Cory of Clear Creek went to the Bangor mines a few days ago. Being of an investigating turn of mind, he prospected for a day or two and was rewarded by the discovery of a quartz ledge that prospects rich. The sample of rock sent to the *Mercury* contains free gold. The ledge is about four feet wide but its extent is yet a matter of conjecture.

Fresno.

WATERLOO.—Madera *Mercury*, Aug. 6: The Waterloo mine will soon change hands. It is not known who are the intending purchasers nor what price they will pay, but it is said that a big figure will be given for it. Swanson's mine near Grub Gulch has been bonded by a San Francisco company for a year. The company has an option of buying at the end of that time for $6000. A five-stamp mill is on the way from San Francisco and will be put in as soon as it arrives. Mr. Swanson will get one-half the proceeds, besides a salary for running the mill. The mine is very rich, a large amount of gold being taken out the last clean-up. There are two Huntington mills on the way to Grub Gulch. They are to be put in mines there.

Humboldt.

WILLOW CREEK MINES.—Blue Lake *Advocate*, Aug. 6: It has not been such a very great while since discovery of gold in quantities on Willow creek and the consequent epidemic of mining locations broke out there. The miners have not found life along the creek an ideal existence. The ounce of bitter has been found in each lump of sweet. Insufficient means to develop their claims has been the great drawback, and the miners, not taking life too seriously, have plodded on, doing, with their primitive methods of separating the gold, the best they could. They have not accomplished much. All this is preliminary to saying that an English syndicate has turned its eyes in that direction and there is a possibility, if not a probability, that it may be induced to take hold of the mines in an energetic way. The company possesses ample means for their development, and if they should pass under its control a new era would dawn upon that mining region. J. J. Moston of Eureka, who has been below to confer with the representatives of the syndicate accompanied by J. L. Callison, a mining man from Nevada, came up from the county-seat Tuesday and departed for Willow creek the same day, the understanding being that Mr. J. Garnett, one of the English syndicate, should arrive in Eureka by Thursday's steamer and immediately join them. Whether anything shall come of the contemplated deal is the merest conjecture. Capital is cautious, and mining investments have not invariably paid dividends in California. Something may come of this visit of Mr. Garnett to the mines, and then again it may result in nothing whatever.

Napa.

A FINE PROSPECT.—*Calistogian*, Aug. 6: Four miles, air line, from Calistoga, on C. H. Holmes' Yellow Jacket Ranch, a few miners have been at work several months endeavoring to find cinnabar in paying quantities. It has been the expressed desire of the principals that nothing be said publicly about the work unless something was found worthy of mention. Now, however, developments have been made that warrant us in writing of them. A shaft was sunk to a depth of 113 feet, then a drift from it was started. A small vein of cinnabar was encountered, and upon this the miners drifted, the work progressing somewhat slowly, as in cases where steam power is not used in hoisting earth. For about 150 feet the vein was followed until a few days ago, when a body of cinnaber was cut, the extent of which is unknown. Last Monday the drift had been advanced into the body a distance of 15 feet, nothing being cut except ore, and the whole face is still in ore. The outlook is good for a mine there, and Calistogians will look forward with much interest to the result of further work, as a good quicksilver mine there would be of value to the town. On the property there is a furnace, which, though old, has been but little used, and can be put in complete order in less than a month. Thus there will be but little delay in producing quicksilver in case developments warrant the making of necessary repairs, and there is every reason to believe, at this time of writing, that they will.

Shasta.

BONDED. — Shasta *Democrat*, Aug. 3: The Quartz Hill, owned by Thomas Harrison, Bob Lyons and Steve Meek, and the first extension south, owned by W. T. Hiatt, all of Buckeye, has been bonded to a gentleman representing the company operating on the Sky-blue mine. The people who have bonded the property have commenced development by sinking a shaft on the ground, and will put it down to water level, when a crosscut will be run north and south from the bottom of the shaft. The bond runs for so short a time, that, taking into consideration the extensive work started, it is believed it is equivalent to a sale. The Bell brothers are inclined to the belief that their lead prospect near Buzzard Roost will develop into one of the best pieces of mining property in the county. They will expend considerable money developing the property this year, and next week Mr. Scranton, superintendent of the Sunny Hill mine, will take charge of the lead prospect. Geo. McDaniels is up in the vicinity of Copper City prospecting for the Bell brothers. Mr. Hart, Sr., has 25 miners at work in the Ballychoop mine.

NEVADA.

Washoe District.

CON. CAL. & VA.— 1500 level: From the south drift at point of connection with the old stopes, we continue to extract some ore and fillings of average milling value. From the upraise which was carried up from the end of the crosscut run west 36 feet in from the main south drift, 155 feet south from the shaft station, we have continued to work upward and to extract ore of fair quality. 1600 level—We have continued prospecting upward from the old sill floor to the old stopes, from which some ore of fair quality is being extracted, and have been making some repairs to the main south lateral drift. 1750 level—In east crosscuts No. 1, 3 and 5 from the main south drift, in working upward from the sill floor, have continued to extract some milling ore. From the end of the drift run south, 88 feet from the end of the crosscut run west from the end of the southwest drift, the upraise has been carried up 21 feet; total height, 44 feet; in a porphyry and quartz formation which carries a low assay value. Are repairing and retimbering the main southwest drift. 1800 level—Along the south end of the drift running south from the crosscut run east from the winze No. 1 sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. From the bottom of winze No. 2, down 45 feet, a west crosscut, No. 2, has been advanced 24 feet in a quartz formation of very low assay value. There has been extracted from all parts of the mine during the week 978 920-2000 tons of ore, which was shipped to the Morgan mill, the average assay value of which, per car samples, was $23.08 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $19.42 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $14,700.68. Bullion on hand in our assay office, assay value about $15,323.90.

OPHIR.—1165 level—From the south drift 101 feet below the sill floor of the 1465 level, at a point 84 feet in from its mouth, the west crosscut has been advanced 24 feet; total length, 84 feet, continuing in a quartz formation showing clay separations and carrying a very low assay value.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, at a point 40 feet east from the winze, has been advanced 20 feet; total length, 209 feet; in porphyry with some clay and fine lines of quartz carrying low assay value.

UNION CON.—900 level—The Joint Union Con. and Sierra Nevada west drift has been extended during the week 25 feet; total length west from the joint shaft, 2277 feet. The face is in a mixture of quartz and porphyry of no value.

UTAH—340 level—From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 45 feet; total length, 137 feet, continuing in porphyry showing some clay seperations.

SIERRA NEVADA.—The east crosscut No. 2, 200 feet south of No. 1, 1000 feet in Kenosha tunnel has been advanced 35 feet; total length, 70 feet; face in porphyry and streaks of quartz. The joint Sierra Nevada and Union west drift, 900 level, was advanced 25 feet; total distence west of shaft 2277 feet, face in mixture of quartz and porphyry of no value.

BEST & BELCHER. — 900 level—During the past week west crosscut No. 1 has been advanced 10 feet and discontinued; formation passed through was hard west country rock; total length, 416 feet

GOULD & CURRY. — 200 level — Northwest drift, started 435 feet west of shaft, has been extended 14 feet through hard porphyry; total length, 453 feet. On the Sutro tunnel level, we have finished repairing the joint north drift with the Savage company, and started to work in the face.

HALE & NORCROSS.—We have finished retimbering the main shaft between the 400 and 500 levels, and have started to retimber the shaft at the 1100 level. The south drift was advanced 30 feet; total length, 60 feet; face in porphyry. These drifts are continuing outside and east of the ledge.

CHOLLAR.—Are making repairs on the 450 and 650 levels. The east crosscut near the north line, 900 level, is in 115 feet; face in soft porphyry.

POTOSI.—Extracted and sent to the mill in the past week 484 1000-2000 tons of ore from the 930, 1100, 1150, 1200 and 1300 levels. Milled during the week 484 tons. On hand at mill, 108 500-2000 tons; average battery assay, $25.30; average car sample assays, $30.30. Shipped to Carson Mint 85½ pounds of crude bullion.

BULLION.—Have excavated and timbered for a chute at the 1300 station in Potosi winze. Are cleaning and repairing south drift on 1300 level, preparetory to raising in the body of quartz found in east crosscut, 320 feet south of north line. Have resumed sinking the joint Potosi winze. The northwest drift from the 1300 station of Ward shaft has a total length of 692 feet; face in hard porphyry.

ALPHA.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 344 feet; face shows quartz of low assay value.

WARD COMBINATION SHAFT.—The joint Alpha and Exchequer south drift from the nort line of Exchequer, 1800 level of Ward shaft, has a total length of 344 feet; face shows some quartz of low assay value. The joint Bullion and Potosi northwest drift, from the 1800 level, has a total length of 692 feet; face in hard porphyry.

CON. NEW YORK.—The winze in No. 4 west crosscut, 650 level, is down on the slope 56 feet, bottom shows some fair-grade ore.

SILVER HILL.—No work has been done in the mine the past week owing to the closing down of the Justice shaft. Resumed work yesterday.

ANNEX.—During the week east crosscut No. 1 north on the 420 level was advanced 18 feet; formation quartz and porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels have extracted and milled 175 tons of ore of the average assay value of 21.40 per ton as per battery samples. West crosscut No. 4, on the 750 level, has been extended eight feet; face in hard porphyry. East crosscut from Zadig drift, Sutro tunnel level, has been advanced 21 feet in favorable-looking vein matter.

Ploche District.

FINISHED UP.—Ploche *Record*, July 28: The corps of mining engineers and experts, which for six weeks past has been examining the various properties of the Ploche Con. M & R. Co. here and vicinity, has completed its labors and withdrawn. The last to finish up was Prof. E. E. Olcott, who to-day left for Ferguson district, where he will examine the mines before starting for the north. Prof. Olcott's report on the properties here is full and exhaustive in every detail, and is believed to be a favorable one. It is said the examinations ere made in the interest of the Consolidated Kansas City Smelting & Refining Company, with a view to consolidation or outright purchase. This company is already a vast and successful concern, and should they obtain a footing in this section, a long era of profitable business is looked for. As nearly as we can learn, the matter will be definitely determined within the next 30 days. Matters at the smelter are progressing very favorably. The output of bullion is unusually large, which speaks volumes for the management. The Yuba is still looking exceedingly well, large and new bodies of ore showing, as a result of the development of the last few months. The Poorman claim, east of town, is steadily improving. The working force has been slightly increased, and the production for the month will be double that for June. The smelter is still turning out lots of bullion and running very smoothly. Sorting has been resumed on the old Bristol smelter dump, and seven men are engaged in the work. It is calculated that several thousand tons of material which will pay handsomely can be yet gotten out.

Tuscarora District.

NAVAJO.—*Times-Review*, Aug. 5: The stopes above the 350-level are without material change. Everything running as usual.

DEL MONTE.—Hauled to and worked at the concentrating plant 168½ tons, average assay value $38 per ton.

NORTH BELLE ISLE.—No. 2 upraise, south 500-foot level, extended 20 feet, total length 70 feet. The stopes are yielding some very good ore. No change elsewhere in the mine since last report.

NORTH COMMONWEALTH.—Second level: Cleaning up the drifts and repairing where needed; also at No. 3 shaft. Hauled and worked at concentrator 168½ tons, battery assay $38 per ton.

COMMONWEALTH.—East drift from chute 5 in east crosscut connected with Queen opening, exposing low-grade ore. Have started joint west drift on the line, also dritting east on the line in the west vein, showing some good ore. Have started to open stopes on the west vein just north of line; ore is high-grade but small.

BELLE ISLE.—Line crosscut, 250-foot level, extended 10 feet. Upraise from south drift, same level, extended 14 feet. A winze has been started on the ore at this point; the vein is getting wider, ore very rich. Upraise from No. 2 stopes extended 12 feet. East intermediate crosscut above the 350-foot level, extended 7 feet, cutting the vein again in good ore.

NEVADA QUEEN.—North drift from No. 5 advanced 19 feet in vein metter. North drift from No. 6 advanced 20 feet, one foot of good ore in the face of drift. North drift from No. 7 extended 18 feet, showing second-cless ore assaying $40 per ton. Line drift, west vein, in 90 feet, exposing four inches of $80 ore. Line drift going west in the east vein has been started, three feet of $25 ore in the face. South from No. 3 crosscut there is one foot of $200 ore. Extracted 13 cars first-class ore, and worked at the concentrator 252.9 tons, average assay $30.15 per ton. Received from Union mill $5051.22.

ARIZONA.

SILVER ANN COPPER.—Cor. Los Angeles *Times*, Aug. 6: There has been no silver development of great importance in the Territory since the discovery of the Tombstone mines. The much vaunted "bonanza" mines at Quijotoa were a dead failure from the start. They have been worked, in a desultory manner, on the San Francisco stock market for several years, the stock being now peddled at a nickel a share—which is five cents more than it is worth—and a plaster of the same amount in the shape of an assessment as often as the patient's—the patient stockholder's—pulse indicates that he can stand it. The old Silver King, that wonderful mine which has furnished such remarkable specimens of native silver, has been gutted, as far as the visible deposit is concerned, though there are those who believe that by judicious prospecting ore might yet be found. The mill has been moved away from Pinal. The Reymert mines in Pinal county, belonging to a resident of your city, which turned out a considerable amount of bullion, have been shut down for some time, owing to difference of opinion among the owners. There are, however, many smaller silver mines being worked on an unpretentious scale throughout the Territory, the aggregate output of which is quite important. Many of these have a good chance to develop at any time into a bonanza. The Harqua Hala mines, in northern Yuma county, which were discovered about three years ago, have proved to be veritable bonanzas, turning out a large amount of bullion. The Mammoth gold mine, on the San Pedro near Tucson, owned by Englishmen, is also making a good record for itself, turning out bullion steadily from a large mill. It is, however, in copper that Arizona is at present most distinguishing itself, as far as mining is concerned. The copper deposits of Arizona are wonderful as to richness of the ore. Few copper deposits could be worked under such unfavorable circumstances as these. There is the Old Dominion mine at Globe, which is nearly 100 miles from the railroad. Coke, to be used in smelting, has to be hauled this distance by team. Yet the Globe mines have a large and increasing output and pay "big." The United Verde copper

mine, in Yavapai county, has a tramway 20 miles long, to connect with the Prescott and Arizona Central railway, and supports a large camp. Another flourishing copper camp is that at Bisbee, near Tombstooe. The town is booming just now. They have a railroad from Fairbanks, electric lights, and are talking about a street-car line. The copper mines at Clifton, in Graham county, continue to turn out a stream of metal. The value of the copper produced in Arizona in 1892 promises to be close up to $5,000,000. Large onyx deposits have been discovered recently in Maricops, Cochise and Yavapai counties. The latest is a discovery of black onyx in the latter county.

IDAHO.

FLORIDA MOUNTAIN.—Silver City *Avalanche*, July 30: The Black Jack is owned and operated by the Idaho & Pittsburg Mining and Milling Company. The majority of stockholders are residents of Pittsburg, Pa., and their interests are carefully looked after here by Frederic Irwin, the superintendent. In 1890 and 1891, a crosscut was run some 1200 feet to cut the Black Jack ledge and develop the property. An Ingersoll-Sargeant air-drill plant was erected at the mouth of the tunnel. The Black Jack ledge was cut 945 feet in, but was comparatively barren. The crosscut was exteoded on toward the Empire State vein several hundred feet, but work on the same is now discontinued. A drift was started south on the Black Jack vein, and it was on this, 312 feet from the crosscut aod 1257 feet from the mouth of the tunnel, that the rich ore mentioned some three weeks ago was struck. They have run the drift about 70 feet farther, and the ore continues even richer and in a larger body than when first opened. For 70 feet now they have had from 6 to 18 inches of ore which a conservative estimate would value at $200 per ton. The ore which is now being sacked for shipment has an average assay value of over $600 per ton. No stoping has been done, all the ore so far extracted coming from the drift, and the pay streak is as strong in the present face as at any point oo the shoot. The ledge is between solid granite walls, and the present workings are about 800 (estimated) feet below the surface. The ten-stamp mill erected hy the company last year in anticipation of opening a body of ore on cutting the Black Jack ledge, whicb has been lying idle almost since its completion, will now be remodeled to adapt it to the changed character of the ore, which is now slightly base. A nine-ton lot of ore was milled last week for a test, and it is probable that concentrators will be added to the plant. We could not visit the north side of Florida mountsin without calling at the Phillips & Sullivan mine, owned by Isaac Phillips and J. F. Sullivan. This is one of the camp's steady bullion producers and has ore enough in sight to keen all the mills in the county at work. The Belfast crosscut, 636 feet in length, run by cootract during the past winter, has opened a 13-foot ledge of rich ore at a good depth. Connections were made witb the winze last week, and now excellent ventilation is secured. This tunnel is connected with the boarding-house level by 110-foot winze. The Hick's winze extends from the latter level to the surface, a distance of 120 feet. The property is well opened and prospected, and the ore reserves are immense. A new ore-house 15x30 feet is now being built near the month of the Belfast tunnel. As soon as this is completed, a force of miners will be started in the stopes.

MONTANA.

THE WASTE DUMPS OF BUTTE.—*Inter-Mountain*, Aug. 6: The vast waste dumps of this district, for sucb a comparatively new mining country, are sources of wonderment to visitors from abroad. It is an easy matter to make a visitor believe that in the underground workings of the Lexington mine there are some 14 miles of tunnels and drifts, after he has viewed the enormous quantity of waste on the dump. It represents an extraordinary expenditure of wealth and muscle, and in most mines the dumps do not represent the many tons of waste which are used in filling up the interior workings of the mines. Hundreds of tons are daily used in the Anaconda mine in filling in places to make the workings more secure. In conversation a few days ago with an old miner who has had a varied experience of over half a century in different mining districts, he incidentally mentioned a peculiarity of tbese dumps. In the taking out of waste a large percentage of ore necessarily accompanies it, and he said that if after the lapse of 50 or 60 years a drift was run into the dump, the ore would be found to have stratified and formed itself into a ledge similar in every way to a natural ledge enconntered in the earth. A piece of iron left in the dump will after a time attract to itself particles of mineral, and if removed, after being buried for ten years, will be found to be several times its natnral size.

THE ROCHESTER DISTRICT.—Reports of mining operations in the vicinity of Rochester are very enconraging. Edward Mueller is working the Buffalo and employs two sbifts of men. It is said that the average net yield of this property during the past few weeks has been $700 per day. Regnlar shipments of ore, which averages 80 ounces in silver to the ton, are made to Butte and Omaha. The Nancy mine is operated by Porter and Deacon of this city. Tbe ledge on this property is quite narrow, but the assays made run very higb in silver and gold. The lowest returns received were 70 ounces and the highest 1360 to the ton. A shaft 70 feet in depth is on this property. Leavitt and Ward are leasing on the Watseka and are only engaged in surface work. A whim hoist is being operated on the property and the retnrns are said to be very satisfactory to the leasers. Bartine and company are working some properties abont two miles from the Watseka and are producing some very fine silver and lead ores. Ryan and Malloy are working an adjoining claim and bave erected a whim and hoist on tbe property, from which a fair quality of ore is being obtained. This last does not by sny means include all the paying mines of this district. The hills are dotted with shaft houses and windlasses, and it is estimated that some 30 or 40 prospectors are in that neigbborbood this summer, all iotent npon the uncovering of the rich ore bodies whicb are believed to exist in that section of country. W. A. Clark of Butte has a representative in that country and it is said that some very promising prospects have been discovered. A Kansas City syodicate has also made recent explorations in that vicinity, and if anything of an encouraging nature is discovered, the gentlemen who compose the syndicate will bond several of the most promising mines.

SOUTH DAKOTA.

THE FAMOUS J. R. MINE.—Deadwood *Pioneer*, Jacob Lampert, one of the principal owners of the J. R. mine, which is jnst now attracting considerable attention, was in the city yesterday. Tbe mine is located on Spring creek, about three miles from Hill City, and is free-milling ore. A sbaft has been sunk to a depth of 70 feet, disclosing a vein of quartz varying in width from 18 incbes to 8 feet, aod carrying an averags of $50 a ton in gold. The ore is being milled at the Summit mill, now owned by the J. R. Company, and the rock is hauled a distance of three-quarters of a mile. The last run of ten days netted over $3000 witb five stamps. The J. R. was located originally for tin, but prospecting disclosed the fact that the ore carried gold in paying quantities. From the present outlook, it will prove one of the richest mines in the Black Hills.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 11, 1892.

General trade the past week has been fairly active with a large increase in the volume of goods sent out. From all we can learn, the buying has been largely of an assortment character, although more stock buying from distant points was noted. Retail merchants are pursuing a conservative course, and do not show any disposition to buy beyond near-by wants. This is a healthy sign, and if persisted in, it will he greatly to their advantage in the end. The general tone of the market is firm, with a tendency to bigher values in some lines. The cut in freights by sail between New York and this port, while accepted as of the greatest possible advantage to the wholesale trade in this city, is, for the present, a disturbing factor in this—that no one can tell how low freights will be sent by sail or steam via Panama or by the overland transportation companies before the bottom is touched or a compromise is effected. While the present situation unsettles the market for leading articles brought from the East, yet signs are not wanting going to show that importers are taking advantage of the favorable conditions to import heavier than ever before. The lower freight rates will largely offset the disadvantages under which they work through the high local freights. The railroad company, the past week, reduced freights to points in Oregon and Washington. This ought to place our merchants on a more favorable footing in those two States. Farm and orchard products are moving quite freely, particularly that of fruit. The high prices realized here and at the East are putting the industry on a far more stable footing than was done two years ago. The high prices in 1890 were followed by a big speculative boom in lands, etc.; but this year the feeling is more conservative and therefore much better for all interests concerned, Foundrymen and ironworkers in general report, as a rule, more orders executed and in hand than has been the case for several years past. Structural material is being called for quite largely. This is due to more building and other improvements under way than ever before. The local money market continues to rule easy, although there is a steady increase in the call for funds from the country for crop purposes. It is quite generally claimed that all requirements will be met without any undue closeness or friction in the market. The very beavy shipments of fruit and other products eastward give a liberal supply of exchange on tbe East, while renewed exporting of wbeat gives a liberal supply of exchanges on Europe. It is claimed that from now on there will be a steady gain in the amount of grain sbipped from this coast. Eastern mail advices continue to report an easy money market. The placing, by the Treasury, of the Chicago national banks on the same footing with tbe New York national banks relieves, to a great extent, the latter banks of the large drain of money, during crop seasons, of funds for the central States. This relief so far equalizes the money market that in moving the crops the serious frictions heretofore felt will be done away with. The labor troubles at the East continue a disturbing element there.

SILVER—The market has declined rapidly; today London cables 38¼d and New York telegraphs 83 cts. These low prices take the general public by surprise, but bankers and capitalists having connections with England were not ouly prepared for the drop, but look for still lower prices before the bottom is touched. The way in which the market acted previous to the last serious decline not only indicated lower prices, but also that it was under strong manipulation. The prevailing opinion today is that the commercial countries will be forced to take a most decided stand in favor of protecting silver, and at the coming International Monetary Conference action will be taken in that direction. England, which has stood so stoutly for gold, will doubtless change front, for the drop in silver has unsettled exchanges, and demoralized trade by destroying the purchasing power of silver. The greater part of England's trade is with countries and colonies that use silver, and the drop in the market value of the metal has paralyzed the trade with them, so that, in self-protection, tbat nation must aid in reinstating silver to its former standing as a circulating medium of trade and commerce. Germany's course will be influenced hy England's, and as for France, Italy and other European countries, they have always stood for bimetallism.

MEXICAN DOLLARS—The drop in silver has demoralized the market, and it is difficult to get correct quotations. The market is nominal at around 67¼ cts.

QUICKSILVER—Receipts the past week aggregate 125 flasks from Australia and 425 flasks domestic. The market at the East continues weak. In our market, concessions are made to buyers, but no lower quotations reporteó.

LIME—Imports the past week aggregate 2356 bbls. The market is steady at $r.25@1.50 per bbl. There is a fairly active demand.

BORAX—Receipts the past week aggregate 220 ctls., and exports by sea 1016 ctls. to New York. The Candelaria *Belt* says: "Negotiations are now in progress for the consolidation of the various horax companies in western Nevada, together witb the works at Daggett, Cal., and the properties in the State of Washington. The interests to be brought together represent a capital of $2,000,000, and it is probable that as soon as the combine is effected the price of borax will be put at a figure that will justify the resumption of operations at the marshes that are now idle in this country, whicb will benefit this section mightily."

PIG IRON—The low freights offered by sail from New York has tended to weaken our market, and although quotations are unchanged, yet they are considered more or less nominal. The consumption on this coast is larger than it has been for years. New York mail advices report still lower prices, as do cables from England.

TIN—In our market the demand for both pig and plate is lessening. New York and English advices indicate that another bull campaign is being inaugurated, but whether it will he as successful as the last remains to be seen. Imports of pig the past week aggregate 2519 from Australia.

COPPER—The market has held fairly steady the past week. European advices report an increase in the stock with charters in Chili for the shipment of 2200 tons. New York advices report a fairly steady and conservative market.

PIG LEAD—The market is essentially unchanged either on this coast or at the East.

COAL—Imports the past week aggregate as follows: Tacoma, 4700 tons; Departure Bay, 4738; Newcastle, N. S. W., 6160; Seattle, 3100; Coos Bay, 450. Total, 18,748 tons. The market for spot and for near-by cargoes is reported strong with some asking an advance. For shipments, sellers are firm at full asking prices, owing to ships asking more money to come to this port. Coast coals are irregular. The consumption is increasing slowly.

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	— @	15	
BORAX.			
Refined, in car lots	— @	7½	
Powdered, do	— @	7½	
Concentrat'd, do	@	6½	
All grades jobbing at advance.			
COPPER.			
Bolt	22 @	—	
Sheathing	22 @	—	
Ingot, jobbing	— @	14½	
Do, wholesale	— @	13½	
Fire Box Sheets	22 @	24	
IRON.			
Bar, base	— @	3	
Norway, base	— @	4½	
PIG IRON.			
	Spot.		
Eglinton ₩ ton	22 00@—		
Glengarnock	23 00@—		
Am. Soft, No. 1	24 00@—		
Oregon Pig	—@—		
Puget Sound	—@—		
Clay Lane White	24 00@—		
Langloan	22 00@—		
Thorncliffe	23 00@—		
Gartsherrie	22 00@—		
Barrow	22 00@—		
Cargofleet	22 00@—		
CHROME IRON ORE.			
Per ton	10 00 @—		
LEAD.			
Pig	— @	4½	
Bar	— @	5½	
Sheet	— @	7	
Pipe	— @	6½	
SHOT.			
Drop, sizes *smaller* than B, ₩ bag of 25 lbs	$t 85		
Do do, B and *larger* sizes ₩ bag of 25 lbs	2 10		
Buck, Balls and Chilled do, ₩ bag of 25 lbs	2 10		
QUICKSILVER.			
Home trade, pr. flask	43 50 @44 00		
For export	38 @		

STEEL.			
English, lb	— @	18	
Canton tool	— @	8½	
Bl'k Diam'd tool	8½@	15	
Pick & Hammer	8½@	10	
Machinery	4 @	5	
Roe Calk	— @	4½	
TINPLATE.			
B. V. steel grade 14x20, spot	— @	6 00	
Charcoal, 14x20	— @	6 00	
Do roofing, 14x20	— @	6 00	
Do, do, 20x28	—@	12 60	
PIG TIN.			
Spot ₩ lb	— @	24	
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$8 00		
Gretta	6 75		
Nanaimo	7 00		
Gilman	6 00		
Seattle	6 50		
Coos Bay	5 50		
Cannel	8 50		
Egg bard	11 50		
Cumberland, in sacks	14 00		
Do, bulk	13 00		
Wallsend	7 00		
Scotch Splint	7 00		
Brymbo	6 75		
West Hartley	7 50		
TO LOAD—PER TON.			
Australian	5 75@—	—	
Liverpool Steam	6 00@—	—	
Scotch Spliut	6 00@—	—	
Cardiff	6 25@—	—	
Lehigh Lump	12 00@—	—	
Cumberland	9 00@—	—	
Egg, bard	10 00@—	—	
West Hartley	6 50@—	—	
COKE.			
English, to load	$8 00@ 9 00		
Do, spot, in bulk	—@10 00		
Do, in sacks	—@12 00		
Cumberland	9 00@—	—	

Eastern Metal Markets.

NEW YORK, Aug. 10.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39	85¼	11 50	3 95	20 65
Friday	38 15-16	85	11 50	4 15	21 65
Saturday	38⅜	84⅜	11 50	4 05	20 65
Monday	38⅜	84¼	11 50	4 05	21 40
Tuesday	38⅜	84¼	11 50	4 05	21 45
Wednesday	38¼	84	11 50	4 05	20 45

Pig Iron continues to rule in buyers' favor, owing to strong selling competition from the south. Copper is fairly firm. Pig Lead is slow, but there is no selling pressure. Pig Tin is again under manipulation. Borax is steady.

THE Presidio and Ferries cable road extension from the junction of Union and Steiner streets, out Union to Baker, and thence on Greenwich to the Presidio, has been completed and is now in operation. The steam dummy is only used from the intersection of Greenwich and Baker streets to Harbor View.

Mining Share Market.

SAN FRANCISCO, Aug. 11, 1892.

Mining shares the past week have been dealt in only to a limited extent by outside investors. The latter's purchases were more or less confined to Union and Sierra Nevada shares, owing to the glowing reports put out regarding the prospects in the Union-Sierra Nevada west drift. There can be no doubt of their striking ore in this drift, but it is equally as certain that it will be more or less broken and that it cannot be utilized to advantage until connections are made either above or below. It is not at all unlikely that when the time comes (after the rings have peddled out a sufficient quantity of the shares), a winze will be sunk; but whether on the ore or not remains to be seen. On the lower levels the ore is more compact and the lode wider and richer than where they will strike it on the 900-foot level. Of course, to sink a winze and do development work will take money, which means assessments. How long it will take to do the work will depend altogether on the length of time the public will pay assessments before selling. How the shares will be manipulated in the meantime the writer does not know, but it is quite safe to say that insiders will first induce buying by better prices and bull reports, after which the old game will be played to the best advantage for insiders. The secret work under way in Mexican, Ophir and two or more of the other mines is very important, and the members of the Mining Stock Association do not "catch on" the same as they did when the share market was considerably higher. The public is getting tired of too much fraud talk. What is now wanted by the large majority is more reliable and explicit news from the mines than is given in the skeleton reports of the superintendents of the mines.

Bob Morrow, who it is claimed is D. O. Mills' confidential broker returned on last Monday, but so far he has not broken the market, according to reports on the street, as was desired by the man he operates for, but it is claimed that he will yet do the work, and is only waiting a favorable opportunity to execute, or have executed by bis brokers, the bear orders. The points are out for lower prices, then get in on the long side. Perhaps this is part of the program so as to more successfully break the market. Sbrewd but conservative operators are watching with considerable interest the movements of the market at New York for railroad and industrial stocks. They claim that with investors attracting to these securities interest in mining shares soon follow, when a real genuine bull campaign is the more successfully engineered. Mail advices under date at New York of August 5, report the market for railroad and industrial stocks, more particularly for the latter, gaining in strength. On this point the financial editor of the New York *Mail and Express* says: "The market is unquestionably as strong as it is quiet and the Stock Exchange commission houses are not at all active. They have comparatively little to do, but their orders are largely on the buying side. They are selling few stocks, but have a long list of orders booked to buy at any concession. There is only this one story. Commission houses are doing very little business because their orders to sell are so small and the market so strong that that buying orders which had been advanced day after day could not he reached. One book showed a list of buying orders twice as long as that for selling, and the buying orders were at low prices still, although they had been advanced. It is quite patent that the investment demand in the market is strong, although it is not especially active." The above indicates that we are nearing an era of more active speculation.

In a letter to secretary Havens, superintendent Lyman of the Consolidated California and Virginia mine says: "We are obliged to report to you that the three bars, Nos. 4197 to 4199, total value $111,337.01 (our shipment of July 26th), do not belong to this company, hut to the Comstock Mill & Mining Company, it having come to our assay office misdirected. We did not discover our mistake until some time afterward. This bullion, of course, is eliminated from our account." The question naturally presents itself; where and how did the C. M. & M. Co. get the bullion? For milling ore, the company, it is said, is paid not in bullion, but in cash, as the vouchers or monthly statements of the mining companies would indicate. Then how does the milling company get bullion? It makes the many believe that not one-half was told in the now celebrated suit of M. W. Fox against the late directors of the Hale & Norcross Mining Co. Even with this knowledge there is a growing conviction with outside investors and operators that if the rings will turn the mills over to the mining companies, and also allow certain other reforms, it would be better to withdraw all suits and let bygones be bygones. By doing this, they think that a boom in the share market would follow.

News from the Bodie district is confirmatory that Mr. Leggett, superintendent of the Standard Mining Co., is, with his usual energy, pushing the work on the electric plant. It will have sufficient power to drive several mills the size of either the Standard's or Bodie's.

News from the outside mining district grows in interest, and if there was any life to the market, the shares of several of the mines would be selling for dollars where they now sell at cents.

News from the Comstock mines is of unusual interest, and points with certainty that the mill rings are getting ready to show up some ore either this fall or next spring. The showing up of ore, it is said, would have been done some time ago had it not heen for the active opposition of D. O. Mills. It is quite generally claimed that Mr. Mills believes more in the returns of the mills than in stock hooms, and therefore it is better to have no ore development made public. The Savage Company reports higher assays and more ore milled, while Con. Virginia reports lower assays. It looks like a seesaw game. From the Gold Hill group of mines, reliable private news is confirmatory of active developing work, and that in several of the mines they are getting ready to extract rich ore. From the Middle group of mines there is nothing new to report.

This afternoon mining shares broke badly on the announcement that the following assessments had been levied: Hale & Norcross 50 cents and Bullion 25 cents.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 2, 1892.

480,006. — HARVESTER — Daniel Best, San Leandro, Cal.

480,067.— CARRIAGE CURTAIN FASTENER—A. Buker, Hueneme, Cal.

479,970.—PRESERVING EGGS—E. T. Burnette, Haywards, Cal.

480,072.—CLOTHES PIN—J. W. Cook, Harrisburg, Or.

480,183.— PAVEMENT—R. D. Duff, Tacoma, Wash.

479,976.—INSECT GUARD—J. Elwood, Sanger, Cal.

480,081.— BOILER—F. X Fischer, Oakland, Cal.

479,938.—CLASP—J. L. Fredlihp, Porterville, Cal.

480,119 — METRIC MODEL — Jas. McCourt, Salem, Or.

480,120.—WALL OR CEILING COVERING—J. P. McMurray, S. F.

480,112.—DRIER — S. A. Meuzemer, Santa Clara, Cal.

480,208.— CASH REGISTER—W. K. Nichols, S. F.

479,918.—WAGON AXLE—N. Olsen, Portland, Or.

480,134.—BRICK KILN—W. Radford, S. F.

479,906.—VINA CUTTER—W. H. Starks, Bellevue, Wash.

480,222.— DOOR CHECK — C. H Timins, John Day, Or.

480,223.—STEAM STAMP—C. W. Tremain, Portland, Or.

480,153.—STEAM ENGINE—Tremain & Johnson, Portland, Or.

The following brief list by telegraph, for Aug. 9, will appear more complete on receipt of mail advices:

California—William N. Anderson, San Raiael, elevator; Mahlon G. Bailey and H. T. Welch, San Jose, book indicator; Arthur W. Coffin, San Francisco, ticket punch; Wilson R. Ellis, Woodland, meat and vegetable cutter; Charles S. Hardy, San Diego, mailing attachment for hooks and like articles; Emory J Nichols, San Francisco, igniter for gas engines; James R Phelps, Sacramento, legspreader for horses; William Willoughby, San Francisco, telegraph transmitter; Henry York and F. W. Austin, Colton, lifting jack. Nevada — A. P. Anderson, Oriental, quartz crusher. Washington—Russell H. Avery, Spokane Falls, coin chute; James H Livermore, Port Townsend extension shoe last. Oregon—Andrew C. Mack, Portland, key fastener; Charles A Marlitt, Portland, temporary stamp; William L. Ulenhart, Astoria, nonrella rib.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Rsonst Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BRICK KILN.—Wm. Radford, S. F. No. 480,134. Dated Aug. 2, 1892. This invention relates to certain improvements in brick and other kilns for similar purposes in which there are a number of adjoining chambers adapted to communicate with each other through suitable doors or openings, and also communicating with a common flue. In a former patent to the same inventor a perpetual kiln is shown, consisting of a series of communicating chambers surrounding a central chimney and having flues connected with said chimney with means for cutting off or uniting any two or more of the chambers so that the burning may be carried on continuously in a certain number of the chambers, fresh chambers being added from time to time and others being cut off as the work is completed within them. In the present invention, Mr. Radford has made improvements in the arrangement of communicating passages, dampers or gates for cutting off or opening said passages, ventilating openings, etc. The draft may be regulated at will at all times, and may be directed to any portion of the burning chambers.

BOILER.—Frank X. Fisher, Oakland. No. 480,081. Dated Aug. 2, 1892. The object of this invention is to provide an economical and effective boiler, more particularly a portable boiler of that type known as "return flue" and which is especially adapted for burning straw and is consequently most used in the harvest field either for a traction or a thrashing engine, a harvester or other movable implement. The patent covers certain combinations of devices and peculiarities of construction.

WALL OR CEILING COVERING.—John P. McMurray, S. F. No. 480,120. Dated Aug. 2, 1892. This invention relates to an improvement in the construction of walls and ceilings whereby the inventor is enabled to produce a hard, firm surface and to reduce the liability of such surface to crack and break.

TRAVELING HARVESTER.—Daniel Best, San Leandro. No. 480,006. Dated Aug. 2, 1892. This improvement in traveling harvesters and thrashers consists in certain details of construction and the means for applying the power of the two driving wheels independently to the heading and conveying portion of the apparatus and to the thrashing and cleaning portion respectively.

DRIER.—Augustus Menzemer, Santa Clara. No. 480,112. Dated Aug. 2, 1892. The object of this improved drier for fruit and other articles is to better distribute and equalize the heated air throughout the entire contents of the apparatus.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alta S M Co, Nevada	43	10c	June 18, July 26, Aug 16		L Osborn, 309 Montgomery
Bodie Cons M Co, California	14	25	June 20, July 24, Aug 22		H D Walker, 3 9 Montgomery
California Verde Antique Marble Co, Cal	2	1c	July 12, Aug 23 Sept 12		W J Gurnett, 308 Pine
Commonwealth Cons M Co, Nevada	8	10c	June 13, July 21, Aug 18		R R Grayson, 331 Pine
Cons New York M Co, Nevada	8	10c	June 18, Aug 2, Aug 23		C E Elliott, 309 Montgomery
Del Monte M Co, Nevada	6	10c	July 25, Sept 5, Oct 5		J W Pew, 310 Pine
Exchequer M Co, Nevada	33	1c	July 27, Aug 31, Sept 20		C E Elliott, 309 Montgomery
Florida Hill M Co, Idaho	4	3c	July 29, Sept 2, Sept 28		R R Grayson, 331 Pine
Gold Mt M Co, California	3	$2	July 16 Aug 20, Sept 8		J F Curtis, 325 Montgomery
Golden Fleece Gravel M Co, California	17		July 16, Aug 24, Sept 20		W J Gluyson, Phelan Block
Gover M Co, California	3	10c	July 28, Sept 1, Sept 28		R McF Doble, 15 Fremont
Gray Eagle M Co, California	29	6c	July 6, Aug 9, Aug 13		A W Barrows, 303 California
Guatemala & California M Co, Honduras	7	$1.50	Aug 9, Sept 15, Oct 8		E Oliver, 22 Mint Avenue
Hale & Norcross M Co, Nevada	102	50c	Aug 11, Sept 15, Oct 7		A B Thompson, 3 9 Montgomery
Justice M Co, Nevada	51	40c	July 26, Aug 31, Sept 19		R Kelly, 419 California
Kentuck M Co, Nevada	4	10c	July 1st, Aug 18, Sept 8		J W Pew, 310 Pine
Mountain Tunnel M Co, California	5	7c	July 28, Aug 27, Sept 26		E O Lander, 219 Sansome
Ophir M Co, Nevada	48	50c	June 3, July 7, July 27		E B Holmes, 3 9 Montgomery
Peer M Co, Arizona	13	10c	July 19, Aug 25, Sept 23		A Waterman, 3 9 Montgomery
Peerless M Co, Arizona	18	5c	July 6, Aug 11, Sept 7		A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	5c	July 11, Aug 11 Sept 12		G R Spluncy, 310 Pine
Silver Hill M Co, Nevada	31	5c	Aug 2, Sept 6, Sept 27		D O Hates, 3 9 Montgomery
Silver King M Co, Arizona	8	25c	July 29, Aug 27, Sept 27		J W Pew, 3 0 Pine
Union Cons M Co, Nevada	46	20c	July 15, Aug 24, Sept 13		A W Barrows, 303 California
Western Star M Co, California	1	2c	July 25, Aug 30, Sept 21		J A Reed, 328 Montgomery

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Independence M Co, Nevada	Annual	J W Pew, 310 Pine	Aug 15
Julia Cons M Co, Nevada	Annual	J Stadfeldt, 309 Montgomery	Aug 20
Martin White M Co, Nevada	Annual	N L Ross, 129 Sutter	Aug 18

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	15	T Wetzell, 310 Pine	Aug 18
Cons Cal & Virginia M Co, Nevada	60	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Aug 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 26

New Incorporations.

The following companies have been incorporated, and papers filed in tbe office of the Superior Court, Department 10, San Francisco:

COTATE Co. Capital stock, $100,000. Object, to carry on a real estate business. Directors—Charles Page, Wilfred Page, Arthur Page, George Thomas Page, John D. Mailliard.

AMERICAN IMPROVEMENT Co. Capital stock, $250,000. Object, to carry on a street-sweeping business. Directors—Michael J. Donahoe, John W. Morshead, George S Switzer, John G. South, Simeon S. Buuge.

ALLEGRETTI CALIFORNIA FLOWER AND TRANSPORTATION CO Capital stock, $300,000. Object, to operate and utilize, as far as they are adaptable, certain patents for the preservation, storage and transshipment of flowers, flowering plants and vegetables. Directors—L. Allegretti. Frank Allegretti, G. Allegretti, Charles F. Runyon and James A. Watt of this city.

WESTERN BAKERY Co. Directors—Frederick Hilsz, K. Hilsz, R. Anixter, Charles Hilsz and S. Joseph Theisen.

MCGLEW ORE CONCENTRATOR CO — Capital stock, $250,000. Directors—Thomas McGlew, John B. McGlew, Harry Barnere, Frank Berrere and William S. Mollison.

B. H. PATRICK & Co.—Capital stock, $10,000. Object, to manufacture and vend stamps and stencils, principally in this city. Directors—Benjamin H. atrick, James M. Patrick, J. G. Mudgett, James H. Pitman, H. Thles.

HUMPHREYS HYDRAULIC DREDGING Co. Capital stock, $300,000 Directors—W. P. Humphreys, George W. Hopkins, J. P. Allen, L. P. Drexler and M. J. Haley.

Mining Companies' Finanoial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Dr.	Cr.		Dr.	Cr.
ARIZONA MINES.			Best & Belcher	— —	2,148
Bullion	7,853	— —	Caledonia	— —	5,489
Crocker	— —	$1,250	Challenge	— —	197
Peer	— —	*162	Chollar	— —	23,500
Peerless	— —	*529	Confidence	— —	5,885
Silver King	$1,983	— —	Con. Imperial	115	— —
BODIE MINES.					
Bodie	— —	*15,583	Con. Cal. & Va	— —	441
Bulwer	— —	7,575	Con. New York	— —	2,610
Mono	— —	4,874	Crown Point	— —	4,205
Standard	— —	39,911	East Sierra Nev	— —	15
Syndicate	— —	1,518	Exchequer	— —	*2,576
Summit	*2,246	— —	Gould & Curry	— —	*14,441
TUSCARORA MINES.			Hale & Norcross	9,000	— —
Belle Isle	*7,291	— —	Julia	— —	5,978
Commonwealth	*22,750	— —	Justice	*1,302	— —
Coptis	— —	6,565	Kentuck	— —	874
Del Monte	22,751	— —	Lady Washington	— —	6,456
Grand Prize	5 562	— —	Mexican	— —	15,553
Independence	253	— —	Occidental	— —	6,563
Navajo	15,160	— —	Ophir	— —	20,737
Nevada Queen	— —	7,246	Overman	— —	615
North Belle Isle	14,524	— —	Potosi	18 846	— —
N Commonwealth	— —	3,375	Savage	8,456	— —
Diana	— —	452	Seg. Belcher	— —	6,278
COMSTOCK MINES.			Scorpion	— —	152
Alpha	— —	7,943	Sierra Nevada	— —	21 857
Alta	— —	*24,575	Silver Hill	— —	*2,021
Andes	— —	15,535	Union	684	— —
Belcher	412	— —	Utah	— —	9,257

*Collecting an assessment.

NOTE.—Con Cal. & Va. has unsold bullion amounting to $26,531.99. Navajo has due on pumping accou t $7,800, and from sal s of ores $7,218.69. North Belle Isle has $2,346.89 due from sales of ore.

WANTED.

A position by a Mining Engineer and Metallurgist. Lead and Copper Smelting. Address Box W., this office.

HORACE D. RANLETT,

Ores, Mining, and Commission,

420 Montgomery St., S. F.

Ships under advances to smelting works in Boston New York, Baltimore and Liverpool.

Twenty-five years' experience in Shipping Ores and Managing Mines.

Solicits Consignments of Copper Produce and Management of Mining Matters.

All business conducted on Cash Basis.

Purchase and shipment of Mining Supplies A SPECIALTY.

Sales of Developed Copper Mines undertaken.

Business Manager of UNION COPPER MINE, Copperopolis, Cal.: NEWTON COPPER MINE, Amador Co., Cal.

HORACE B. GALE,

EXPERT AND CONSULTING ENGINEER

—IN—

Steam and Electrical Engineering.

PROFESSOR OF MECHANICAL ENGINEERING

— AT THE —

Stanford University.

Tests Conducted, Specifications Drawn, Etc. Address: Stanford University, Menlo Park, Cal.

Table of Lowest and Highest Salss in S. F. Stock Exchangs.

NAME OF COMPANY.	WEEK ENDING July 2		WEEK ENDING July 27.		WEEK ENDING Aug 3.		WEEK ENDING Aug 10.	
Alpha	.20	....	.15	....	.10	.15	.15	.20
Alta	.25	.30	.25	.30	.25	....	.30	....
Andes	.35	.40	.35	....	.25	.30	.35	....
Belcher	1.15	1.35	.85	1.15	.85	.95	.90	.95
Belle Isle	.05	....	....	....	....	....	....	....
Best & Belcher	1.55	1 90	1.50	....	1.25	1.50	1.30	1.50
Bullion	.30	.50	.30	.35	.25	.35	.30	.35
Bodie Con	.10	.15	.30	.3	....	....	.30	....
Bulwer	.40	.45	.40	.45	.40	....	.40	....
Commonwealth	.05	.15	....	....	....	....	....	....
Con. Va. & Cal	3.60	3.85	3.30	3.65	3.00	3.30	3.20	3.50
Challenge	.40	.50	.30	.35	.26	.30	.35	....
Chollar	.60	.75	.45	.60	.50	....	.55	.65
Confidence	....	....	....	....	1.30	....	1.35	....
Con. Imperial	....	....	....	....	....	....	....	....
Caledonia	.20	....	.20	....	.10	.15	....	....
Crown Point	.75	.96	.55	.75	.55	.60	.55	.60
Crocker	....	....	....	....	....	....	....	....
Del Monte	.05	....	.05	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	1.50	1.60
Exchequer	2.10	....	.10	....	....	....	.05	.10
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	1.00	1.05	1.00	....	.80	.90	.80	1.05
Hale & Norcross	1.20	1.35	1.10	1.20	.95	1.05	.95	1.05
Julia	.05	....	....	....	....	....	....	....
Justice	.15	....	.10	....	.05	....	.10	....
Kentuck	.15	.10	.05	....	.05	....	.05	....
Lady Wash	....	....	....	....	.05	....	.10	....
Mono	....	....	31	....	....	....	....	....
Mexican	1.50	1.70	1.35	1.55	1.25	1.35	1.30	1.45
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	....	....	....	....	.05	....	....	....
Nev. Queen	.35	.55	.20	.45	.20	....	.20	....
Occidental	.35	....	.30	....	.30	.35	.30	.46
Ophir	2.50	2.75	2.30	2.65	2.05	2.25	2.15	2.40
Overman	.40	.50	.30	.40	.25	.30	.25	.30
Potosi	.40	.50	.40	.50	.45	....	.50	.60
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	....	....
Savage	1.10	1.30	.95	1.10	.90	1.00	.90	.95
S. B. & M	.25	.30	.20	....	.16	....	.20	....
Sierra Nevada	1.15	1.25	.95	1.05	.90	1.00	1.05	1.35
Silver Hill	.05	....	.05	....	....	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.85	1.10	.70	.85	.70	.75	.81	1.05
Utah	.25	.30	.20	.25	.20	.25	.20	.25
Yellow Jacket	.65	.85	.40	.65	.45	.65	.50	.69

*Assessment added.

IF you wish to advertise anything anywhere at any time write to GEO. P. ROWELL & CO., No. 10, Spruce St. New York.

FOR A NOTARY PUBLIC go to Lee D. Craig, No. 319 Montgomery St., S. F.

Assessment Notices.

CALIFORNIA VERDE ANTIQUE MARBLE COMPANY Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 12th day of July, 1892, an assessment (No. 2) of One Cent per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 3 8 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 22d day of August, 1892, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 12th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors.

W. J. GURNETT, Secretary

Office 3 8 Pine Street, San Francisco, California.

GOVER MINING COMPANY. LOCATION OF PRINcipal place of business, San Francisco, California; location of works, near Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23th day of July, 1892, an assessment (No. 3) of Ten Cents (10c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Treasurer of the Company, at his office, Nos. 13 and 15 Fremont Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Tuesday, the 1st day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 26th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

ROGERT McF. DOBLE, Secretary.

Office—Nos. 13 and 15 Fremont Street, San Francisco, California.

WANTED.

Position as Superintendent or Metallurgist.

First class Mining Engineer and Metallurgist, several year's experience in Europe, America and Mexico, is open for engagement. Graduate of one of the best mining schools in Europe. Best references. Address,

Secretary Concordia Club,

San Francisco, Cal.

WANTED.

The owner of a group of Nine Gold Veins, two of which average $30 per ton gold, wishes to give a workiog bond on very reasonable terms, to party who will develop the property. Wood and water convenient and abundant. Only bases in ores are iron and sulphur.

Address Box I. PONY, Montana.

WANTED.

Position as Manager or Assayer, at a gold or silver mine. Many years parctical experience in the manage ment of mines and the milling of gold and silver ores.

Address Box O, this office.

JAMES M. HAVEN. THOMAS E. HAVEN, Notary Public.

HAVEN & HAVEN,

ATTORNEYS AND COUNSELORS AT LAW.

No. 530 California Street,

Telephone No. 1746 SAN FRANCISCO, CAL.

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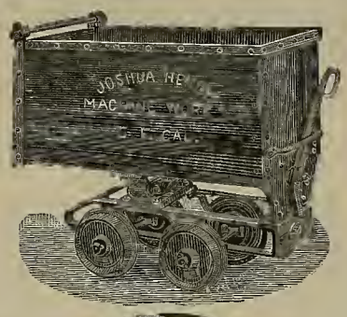

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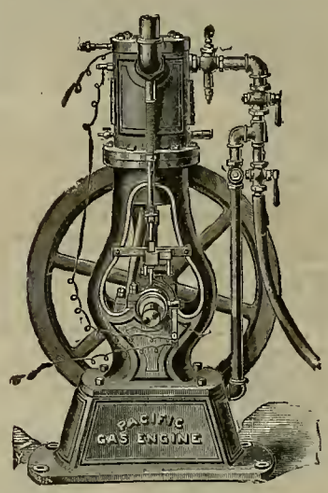

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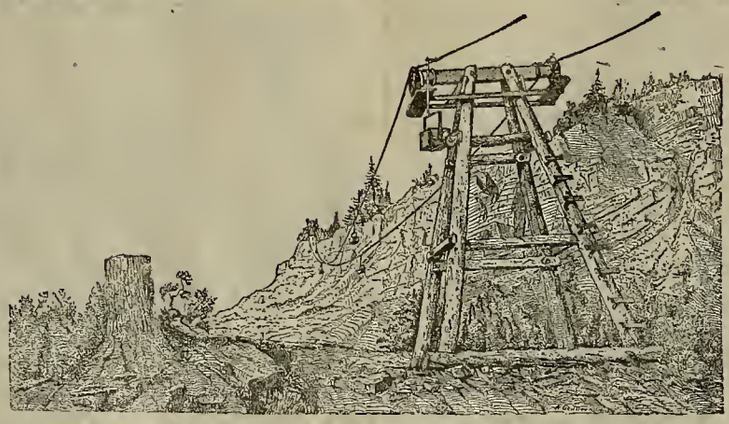

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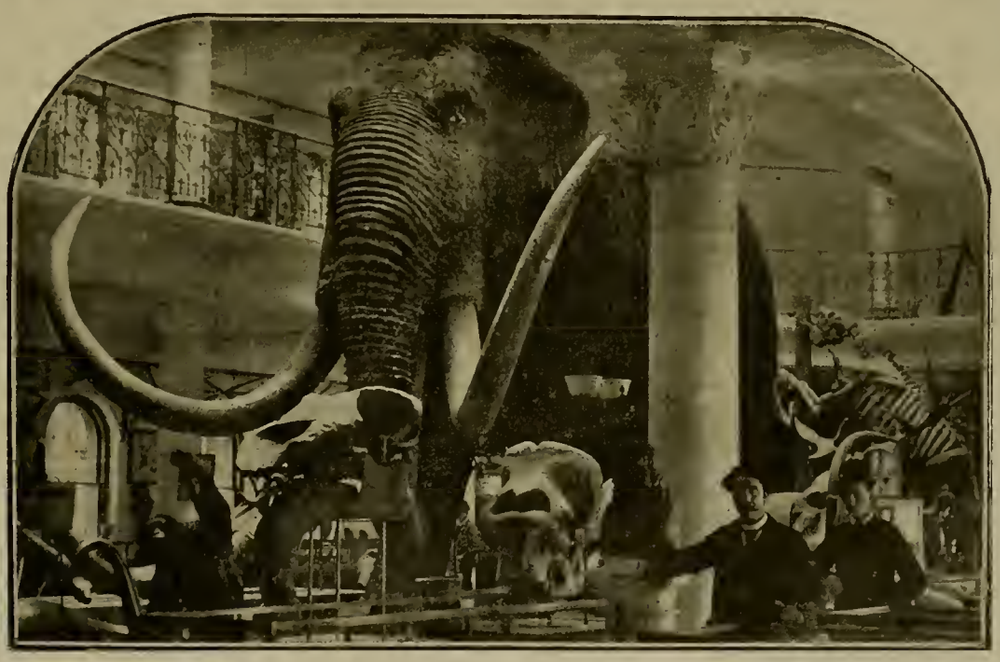
Giant Forms of Extinct Animal Life.

Mammoth remains are among the very earliest forms of extinct animal life which attracted the attention of observers of our earth and its natural products. The whole continent of Europe from France and England to the Ural mountains, and from Sicily to northern Russia, is strewn with mammoth bones in its alluvial and post pliocene deposits. Research has also shown the mammoth in India, Persia, Siam, all northern Siberia, Cbina and Japan. In both the continents of Europe and Asia these remains are found to be more sparsely distributed in the southern lands and to abound in vast numbers on the northern limit, showing thus a strange disagreement in distribution with the elephant of the present day, which is confined, in its wild state, to the tropical portiona of Africa, and to the equally bot countries of India, Sumatra and Borneo. All the northern shore of Siberis, particularly in the deltas of the Lena and the Yenessei rivers and the islands lying off these coasts, is crowded thick with the leg bones, tusks and teeth of these extinct animals. In some places the continued action of sea waves and river freshets have piled these bones together in quantities so vast that their number and volume is something incredible. It is plain tbat the mammoth was once an inhabitant of north temperate and frigid zones; now its descendants, reduced in numbers and degenerate in size, inhabit the tropics. More than a hundred years ago, not only their ivory, but their carcasses, were known to exist in Siberia, imbedded in solid ice. The first discovery of such remains was six degrees north of the Arctic circle, where the body, largely imbedded in ice, was still standing erect, and was almost perfect. The skin remained in place and the hair and fur were still attached in spots.



THE MAMMOTH—A RESTORATION IN THE ACADEMY OF SCIENCES MUSEUM.

The most celebrated discovery was at the mouth of the river Lena in 1799, when a fisherman found a complete body of a mammoth in the ice. The nomadic tribes had been feeding their dogs on the flesh. The skeleton, hide, etc., were carried 7000 miles to St. Petersburg and placed in the museum of the Imperial Academy of Sciences. This is the famous Siberian hairy mammoth, and stands unique in the history of fossil remains from the fact of the preservation of the soft parts of the animal—its flesh and sinews—in connection with the bones.

In the museum of the Academy of Sciences of this city is a "restoration" of this mammoth, made by Prof. Henry A. Ward, of Rochester, N. Y. The height is 16 feet, and length, including forward curve of tusks, 26 feet. The engraving on this page is from a photograph made in the Academy of Sciences museum on Market street. As may be imagined, this mammoth is the central figure in the collection exhibited in the museum-room.

A LARGE colony of disappointed Oklahoma home-seekers have left for Central America.

THE BROKEN HILL MINES, New South Wales, the largest silver-producing mines in the world, have 6000 men out on strike, and the mines are idle. The question in dispute is as to the working of the mines. The mine-owners have decided that the stoping of ore shall be let by contract. The men refuse to agree to this, and ask that it be paid for by day work as at present. The companies are now forced by the unions to do stoping work on what is known as the "double-handed system." That is to say, the men have to work on the face in couples, whether the conditions are snitable or not. The arbitrary enforcement of this rule has a disastrous effect on the economic working of the mines. The owners know that if they are allowed to stope ore by contract, the men who tender for the work would do it by what is known as the single-handed system. The effect of the carrying out of this latter system would be that the work would he done for about half its present cost. The large decreaae which has taken place in the prices of silver and lead has not been without its weight in causing the directors to come to their determination.

PLACER COUNTY MINES.—From Thos. B. Everett, secretary of the Placer County Miners' Association, we learn that the Pioneer mine is running steadily under the management of Mr. Sullivan. The Drummond, up near the head of Shirt-tail canyon is doing well. Remler & Co. of Forest Hill are taking out good ore. The Harlow drift mine at Loomis is in some sort of difficulty just now, but the mine pays and will be going again shortly. The mines at Ophir are very quiet at present, but there is some talk of starting up the Hathaway very soon. As soon as they put in a new crusher they will start up the Gold Blossom. They are using the cyanide process at this latter mine.

THE Contention Consolidated Mining Company of Tombstone district, Arizona, has declared a dividend of twenty cents per share, aggregating $50,000. The last previous dividend of this company was paid in December, 1884, and was at the rate of twenty-five cents per share, aggregating $62,500.

Sites for Manufacturing Establishments.

Large manufacturing establishments require more ground space than is usually available in a large city. The movement away from the crowded center commenced here when the Union Iron Works went out to the Potrero and estsblished their ship-building plant. The Risdon and Fulton Works, the next in size of our foundries, are both seeking better locations. The fire at the Fulton decided the move, as far as they were concerned, and it is probable they will go to Oakland and establish a ship-building plant on tbe edge of the harbor there. Tbe Risdon people are also on the lookout for a water-front location and will bardly remain much longer where they are. These firms both intend increasing their facilities in the direction of marine work. To do this properly they must have water-frontage where vessels can he hauled out or launched. Available water-frontage near this city is rather scarce. The Potrero point of land near deep water is already occupied by the Union Iron Works, Pacific Rolling Mills, gas works, sugar refinery and cordage works. In the large bay beyond that, and this side of Hunter's point, there are wide mud flats extending far out from the beach. At Hunter's point the dry-dock property takes up the water-frontsge, and beyond that, far down until Baden is reached, there are more mud flats. The city-front proper cannot, of course, well be obtained for manufacturing purposes. Along the north-beach frontage there are few available sites for factories. Under these conditions, therefore, we may expect to see some of our large establishments leave us and go across the bay to Oakland and Alameda. The water-front of Oakland harbor has been kept vacant for years by the corporation owning it, but the Railroad Company is showing now a disposition to lease or sell without restriction, so that it can now be utilized.

The fact that the Fulton Iron Works is negotiating for a tract on the Oakland water front has led other manufacturers to look in the same direction. Already the firm has applications for ground from an iron-pipe manufacturer, a bell-casting company, a brass foundry and pump works. This shows that these other firms want more space than they can readily obtain in the city. For the reasons stated, if they want water-frontage they must go across the bay.

Very naturally, all such enterprises will have their offices in this city, and the business portion will be conducted here. But the manufacturing department will not he in the city, and the mechanics and laborers will reside near the works themselves, and not in the city. This will be our loss but Oakland's gain.

THE Ely Mill and Mining Company at White Pine, Nevada, has completed cyanide works at its mill. It has put in four tanks, each tank having a capacity of thirty tons.

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SAN FRANCISCO, SATURDAY, AUGUST 20, 1892

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Brass and Iron Goods—Crane Company.
Technical Books—Henry Carey Baird & Company.

See Advertising Columns.

Comment.

English investors in Colorado mining properties are becoming restive because, while large quantities of ore are being produced, and the local managers live in ease and luxury, the dividends come slowly or not at all. A number of these investors have sent a man over to Denver to find out the reason why, with some $50,000,000 invested in Leadville, Aspen, the San Juan country and other camps, the returns to stockholders are small. The promised investigation will be apt to bring out facts which will render certain persons uncomfortable, as did the investigation here into the Comstock methods of management. It seems odd that in mining affairs the managements get rich, while the stockholders do not. It is unfortunate that this is the case in most of the mining regions where work is done on a large scale. The experience in this city shows that it needs vigorous, aggressive and earnest men to take the companies in hand before reforms can be carried out. Custom gives mining directors and presidents so many ways of making money that any change is very difficult to bring about. For the good of the mining industry in general, the more searching the investigation the better will be the results; and if Colorado expects to get more capital interested, the sooner the bad customs are broken up the better.

Agents are in this city from Ecuador to obtain appliances for working the gravel mines of that country by the hydraulic system. Mr. Russel F. Lord, who has been making an examination of the mines in the province of Esmeraldes, says that the beds will yield an average of 40 cents a cubic yard, and some tracts will run higher. The auriferous territory is in the lower and westerly foothills of the great Andean Cordillera, about 40 miles from the coast. There are several deposits, and the water supply is abundant. Preparations are now being made to outfit and work these properties on an extensive scale by hydraulic process. The estates are traversed by large and swift-flowing streams full of water the year round. The conduits will probably consist in large part of flumes and iron pipes. The pipe, giants and other appliances will be purchased in this city. Natives will do most of the work in the mines, a few white men being employed for superintendents, overseers, pipemen, mechanics, etc., this part of the force having already been engaged in San Francisco. While we now do comparatively little hydraulic mining in California, except in the northwestern tier of counties, there is a demand for skilled hydraulic miners, especially pipemen, from other countries. Many of these men have gone abroad to South Africa, Australia, and South and Central America. Others have gone to Colorado, Oregon and other States. Ecuador is a new field for this kind of work, and the promoters of the enterprise referred to do wisely to come here for suitable men and machinery.

The time is prolific of labor troubles. Besides the two great strikes already on at Homestead, Pa., and Cœur d'Alene, Idaho, three others have developed during the past week. At Buffalo, New York, nine hundred railroad yardmen are striking over a question of wages. They have resorted to violent methods, and besides dealing roughly with nonunion men put at their abandoned work, have damaged the property in their charge and have burned nearly three hundred freight cars loaded with goods worth half a million dollars. State troops are on duty to protect property, but they have not been able to stop rioting or to prevent the abuse of nonunion workmen. In Tennessee there is another labor riot. Here the iron and coal miners are preventing by violence the Tennessee Iron, Coal & Railroad Company from employing convicts in their mines and timber camps. In three instances the guards have been overpowered, the camps destroyed, and the convicts returned to the State penitentiary near Nashville. All this has not been accomplished without a good deal of brutal violence, of which both the guards and the convicts have been the victims. Nearer home, at Port Gamble, on Puget Sound, there was a riot on Friday last of a very different kind. Three vessels lying at anchor were boarded by gangs of union seamen and their crews dragged or driven ashore and warned not to return. The men thus forced from their work belonged to a union, but not to the particular fraternity which dominates the shipping of Puget Sound. Here, therefore, we have warfare carried on with the fierce methods of piracy, not against nonunion men, but against the members of a nonaffiliating and less powerful organization. If there be among the champions of the rights and interests of workingmen anybody hold enough to claim that there is any sort of justice in these proceedings, he is no friend but an enemy of labor. Organization of workmen into unions is as legitimate as the organization of capital into companies and corporations. Organization is labor's legitimate weapon of defense, but the right to organize no more carries with it the right to violent enforcement of demands, just or otherwise, than the right to bear arms carries with it license to murder. The right to strike is a legitimate one, as sacred as the right to labor, but it does not carry with it the right to prevent others from making such engagements as they choose. The labor unions are going to treasonable lengths in assuming the right to enforce their own rules, and it is the duty of the Government to employ its whole power, if necessary, to defend the constitutional rights not only of property-holders, but of nonunion workmen. This country cannot allow the trades-unions to usurp the functions of Congress; it cannot allow the rights of its citizens, either capitalists or nonunion workmen, to be trampled upon. If it should fail in this duty, it would not be worthy to live, and could not live. It must assert, definitely and positively, that the right of the property-owner to his mill, his mine, his railroad or his ship, and that the right of the humblest citizen to labor, are as sacred as the right of the trades-unionist to strike.

The fame of the natural wonders of California is world-wide. The Yosemite with its cliffs and waterfalls, the geysers, the big trees and other wonders must now, however, resign their supremacy in favor of a bald-headed spring. That is, not exactly a bald-headed spring, but a spring which cures baldness. The Jamacha spring is on an old Spanish grant about 13 miles from San Diego. A committee of the Board of Health has reported that the waters really do cause the hair to again grow on bald heads. The water is alkaline, ferruginous, sulphuretted and arsenical. If present reports are fully verified, the Jamacha ranch will become a bald men's paradise, and one more natural wonder is added to the list in California. More people will come to this than to the Yosemite; for there are more bald-headed people with money to travel after hair than there are people with money to spend on mere scenery.

The telegraph brings news from Albuquerque, N. M., about the test of the new Crawford gold extractor on 15 tons of ore from the Snake mines. The account says: "The ore was crushed and was very refractory, still the cleanup showed that the mill had extracted over 80 per cent of the assayed value of the ore, while the old Huntington mill extracted but 60 per cent from the same ore. The assay test from the tailings, added to the product of the run, was greater than the original assay value of the ore. A number of miners from different camps were present at the test runs and were highly pleased with its methods of reducing ore." From this it would appear that the Crawford extractor was a sort of combined machine and process, yet comparing it with the Huntington mill, which is simply a mill, would lead one to believe it was only a crushing appliance. If that is the case, what the percentage obtained from the ore has to do with it is rather puzzling. The crushing of ore is generally preliminary to obtaining its valuable contents and has little to do with the proposition of results. But it is encouraging in this instance for Californians to know there is at last a machine or process which takes out more gold than the ore originally contained. That is the only conclusion when the value of tailings, added to the product of the run, is greater than the original assay value. This machine works the ore to over 100 per cent of the assay value. No wonder it beats the Huntington or any other mill, and no wonder the miners from different camps were highly pleased. They have long been looking for some machine which will do this.

Foundry Notes.

The foundry and boiler-making departments of the Fulton Iron Works not having been very much damaged by the recent fire, work has been continued in them by the firm. The machinery, tools, etc., were, however, destroyed, and since then the tools and shop of the old Pacific Iron Works have been used by the Fulton people. Castings made at the foundry have to be carried around to First street for machine work and finishing. While the arrangement is, of course, inconvenient, it has enabled the Fulton Works to complete their contracts and go on with whatever work is offered. They have just completed four very large boilers for the new electric light plant in this city belonging to the California Electric Light Company, and four more are to be built. The new boilers are of vertical type with very small flues. The plate of which they are made is very heavy, and the boilers are tested up to 150 pounds.

A boiler has also just been made for the new tug for the Harbor Commission. The quarantine boat, with its fumigating apparatus, completed by the Fulton Works, has been tried and found to be successful. A Corliss compound engine for the Currier silk factory at Petaluma is in the shop now. Considerable work is being done also for Mexican orders.

The city of Oakland has raised the $10,000 bonus to bring these works there. Titles to land, etc., are yet to be examined, but everything points to the new works going across the bay. The new works will occupy 42½ acres of land on the Hayes estate. The property lies 750 feet from the railroad line and runs from the south of First street to the edge of a strip of water known as Oakland harbor. The Fulton Iron Works proposes to build a long canal into its property with wharves on each side. On the east side of the canal the ship-building yard and workshops of the company will be erected and a large portion of the land will be reserved for the expansion of the company's business. At present much of the property is a marsh, and it will take some time to put it in shape for building purposes. The title is being searched, and if everything is found to be in good condition, it is probable that the new Fulton Iron Works will be erected in Oakland.

At the last meeting of the State Prison Directors the bill was paid for 25 looms for the new jute mill made by the Oakland Iron Works, that concern having placed the machinery on the ground. These are the first looms of home make ever put in the prison, and they are considered to be very much better than those of English manufacture, which have until now been used in the prison. One of them has been in use for two months, and has been perfectly satisfactory. The California looms cost $175 75 apiece, against $240 for those of English manufacture. The bill for the new looms was ordered paid. They will be placed in the new jute mill with 75 others yet to be made. The amount thus received by a California industry is $17,500.

On Tuesday the new electric street railway in this city was formally opened. It is the Metropolitan Railway, which starts at Powell and Eddy streets and runs to the powerhouse on Carl street and Forest avenue via Golden Gate park. The cars are the latest design in finish and utility, being fitted with three trucks, which do away with that rocking motion in the double-truck car. In the two end trucks are located the motors, each of 25 horsepower, that can easily drive the car at the rate of 20 miles per hour. For the present the road will be operated by electricity from Van Ness avenue out. An injunction taken out by the city restrains the erection of poles from the avenue to the starting point at Powell and Eddy streets, but this distance will be covered by horsecars until the injunction is lifted. When completed, the line will carry passengers from the Baldwin Hotel to the Olympic Club grounds and the beach for one fare, whereas they now pay two. The service is much quicker, and it is the intention to put on a large service, one-minute cars if necessary. The company now has 12 cars at the powerhouse, but will start the road with double that number. Everything connected with the enterprise except the cartrucks was turned out in this city. The engine, a handsome piece of machinery turned out by the Risdon Iron Works, is of 500 horsepower, which drives three dynamos. Two are sufficient to operate the system, but there is room for the addition of a double plant should the line be extended.

The gauge of the Geary-street Cable Railroad has recently been altered, thus necessitating the placing of a new turntable at the junction of Geary, Kearny and Market streets The big steel frame was manufactured at the Pacific Rolling Mills. It is 33 inches thick, 30 feet in diameter and weighs 15 tons. The cost of the frame alone was $2000, and the total cost of the table $3000.

Coast Industrial Notes.

There are 110 men belonging to the Brewers' Union of this city now out on strike.

THE horseshoers of this city are all busy. There are very few idle men belnnging to the the union.

THE engineers of the San Francisco and Great Salt Lake railway are now surveying just east of Reno.

CLAUS SPRECKLES has got two agents in Kern county looking for a suitable location for a beetsugar refinery.

THERE were 238 banks doing business in California on July first last, with resources amounting to $301,046,944.

THE North Pacific Coast railway has contracted for a new ferry steamer, and will soon enlarge its slip at Sausalito.

TTTE big lumber raft at Fort Bragg, Mendocino county, will be ready for launching this Saturday, and will then be towed tn this port.

THE electric road from Ventura into the Ojai valley has been graded for four miles from Ventura and the track is down for two miles.

THE foundations of a 2,000,000 cubic feet gasnmeter are being put in on Bay and Buchanan streets for the San Francisco Gaslight Company.

LABOR COMMISSIONER WALTS has started an inquiry in the matter of unemployed workingmen, with a view to ascertain, if possible, the cause.

ON the 1st of September the California State Board of Trade will move their exhibit into and occupy the entire basement of the Crocker building.

THE Nevada County Miners' Association will have a small stamp mill in full operation as one of the features of the World's Fair exbibit of that county.

CONTRA COSTA COUNTY is becoming quite an object of interest for capitalists of late, owing to the many projected railroad schemes and the fact that most of the lines enter and cross the county.

LAST month there were shipped to Salt Lake from Eureka, Nev., 1649 tons of ore—from Union district 15 tons; from Diamond district 34 tons; from White Pine district 406 tons, and from Morey district 28 tons.

IT is reported that the Ducey Timber Co. of Micbigan has purchased the mills, flume, timber, track, logging railway, etc., of the Kings River Timber Co., on Kings river, Fresno county. This is the plant of Moore & Smith.

A SATISFACTORY understanding has been reached by the parties interested in the proposed starch factory at Petaluma, and the necessary buildings and machinery will be in readiness to commence work as soon as tbe potato crop is ripe.

THE directors of the Electric Lighting and Tramway Company place the loss by the fire at Victoria at $80,000, insurance on the burned property $45 000. T. Teague, architect, will prepare plans at once for a first-class brick, iron and stone building.

THE Journeymen Coopers' Union will open its cooperative shop on Perry, between Fourth and Fifth streets, on the 22d inst. The coopers have received financial aid from the various unions to assist them in sustaining the strike against the nonunion shops.

THE Piedmont Cable Company of Oakland will build a branch electric road from the carhouse on Fourteenth and Center streets to Seventh and Wood streets. The branch line to the cemetery gates has been finished and was in operation for the first time last week.

THE Haywards electric railway will soon be in operation as far as Broadway, Oakland. About 100 men were put to work Monday, and are laying the track at the rate of two blocks per diem. It is expected to have the road in running order toward the end of October.

A. LUSK & CO. have increased the working force at their fruit-canning establishment at Brannan and First streets. Business was so rushing that the addition of 500 women and girls was necessary to take care of the immense supplies of stock shipped in from all directions.

AT a meeting Saturday of the directors and stockholders of the Giant Powder Company and the Safety Nitro Company, it was decided to consolidate the two concerns. The decision was rendered by the heavier stockholders of the two companies and, unless the minority carries enough weight to upset these plans, the combine will go through.

THE large pottery works at Lincoln, one of the institutions of Placer county, while not inordinately rushed, is doing a good business. It receives orders from all parts of the Pacific coast. The quarries at Lincoln, Rocklin, Loomis and Penryn continue to turn out most of the granite used in tbe State, and all of them are working average forces.

FORTY stonecutters are out on strike at J. G. Day's stonequarry at Raymond, Fresno Co., because the owners refused to reduce the hours of labor from nine to eight hours, and pay the same wages—$4 per day. Last April the men informed Day that the union had made a new schedule to go into effect in all quarries in the State. According to the new schedule, the stonecutters were to work eight hours instead of nine and receive the same pay.

THE Tolmans Landing and Vallecitos Railroad Company has filed with the county clerk a certificate of the creation of a bonded indebtedness to the amount of $500,000, as determined upon at a meeting at which 153,000 of the 225,000 shares were represented, being 3000 more than two-thirds of the capital stock issued. George B. Tolman is president, B. Austin secretary, and with L. B. Hopkins, Marian Tolman and Robert Gilbert constitute the directors.

THE Eighteenth street branch of the electric road which runs from Eighteenth and Guererro streets to Golden Gate Park was opened on Monday. President Joost has been authorized to let contracts for a new steam engine and new generators to be put in the powerhouse at Thirtieth street and San Jose avenue, and also for 20 new cars, the latter of the double-generatnr heavy class. The estimated outlay for the new work is $200,000, so that the letting of the contracts will be awaited with interest by local engineering firms. The new work is to be carried out as speedily as possible.

San Francisco Cable Roads.

THE Sutter Street Cable Railway Co. and the San Francisco and San Mateo electric road have made a transfer arrangement whereby transfers are exchanged at Ninth and Harrison streets between the cars of the Larkio street system and the electric road traveling in both directions.

THE new engine and carhouse for the Geary street cableroad, at the corner of First and Point Lobos avenues, is rapidly approaching completion. When finished, it will be the largest powerhouse in this city, its dimensions being 300x107.6, and two stories in height. The company will take possession of its new quarters in four or five weeks and will then move out of the Buchanan and Geary street structure.

A CHANGE contemplated by the Cliff House and Ferries is the extension of the cableline three blocks farther north to Taylor and Jefferson streets. This will mean lifting the turntable from its present location and moving it to that named. In this case all that is awaited is tbe completion of section B of the seawall and the filling of the intermediate water space between it and the half block of ground north of Bay street. A large force of men is at work on the seawall and it is now rapidly approaching completion.

THE Mayor has signed an order granting the Ferries and Cliff House Cable Railway Company permission to construct a street car line on Bay street, and work is tn be commenced as soon as the material which has been ordered arrives on the ground. Superintendent H. H. Lynch says it is the intention of the company to build the line at once. It will start at the junction of Taylor and Bay streets, the present North Beacb terminus of the company's cableroad, and run due east along Bay street to Montgomery. As soon as the work at the seawall and ferries is finished, application will be made for a franchise to extend the line from the junction of Bay and Montgomery streets clear round the waterfront to Clay street. In the district encircled by the line described there is no streetcar accomodation whatever. The Omnibus Cable Company's horsecar line stops at Powell and Bay streets, and the Mission and North Beach horsecar line just a block from that point. From these two termini and that of the Cliff House and Ferries east to the waterfront there is no other road. Within tbe past two years several large factories, and notably two large iron works, employing several hundred men, have been erected on the blocks north and soutb of Bay street, and from Stockton street east. The short horsecar line from Bay and Montgomery streets is to be constructed expressly to meet the demands of this district. The cars will transfer to the Cliff House and ferries, and thence to the Market street system or out Jackson street to the western Addition, practically placing this hithertn out of-the-way district in communication with the entire city.

Mining Briefs.

THE Crossbow Mining Company has levied an assessment of 10 cents per share.

THE mining town of Red Mountain, Colo., was almost entirely destroyed by fire last Sunday.

THE Idaho Gold Mining Company of Grass Valley has declared dividend No. 265 of $2.50 per share, aggregating $7750.

THE directors of the Nevada County Miners' Association have elected Fred Searls to fill the vacancy in the Board caused by the death of George G. Allan.

A FEW days ago D. G. McIntosh discovered a coal vein two and a half miles north of Klamath Falls, Or., on the ranch of J. G. Shallock. It burns readily and clean, and is free from all foreign matter.

THE big smelter at Mineral, Idaho, was burned last week. The loss will reach $50,000, with no insurance This was the only smelter in the Boise Basin mining region, and will very greatly retard the output of bullion.

THE tailings accumulated at the Washoe mill from working the ore from the Justice mine, estimated at 2000 tons, have been purchased by Col. E. D. Boyle of the Comstock Milling Co. for $2000. The tailings assay $13.50 per ton, and are being worked at the Douglass mill.

A special meeting of the Company of Associated Stockbrokers of the San Francisco Stock and Exchange Board has been called for August 22d, at which a resolution, introduced July 11th, empowering the board of directors of tbe association to sell the Board building and real estate on Pine street for a sum not less than $450,000, will be voted upon.

THE sale of an onyx mine in Lower California has been consummated to an Eastern syndicate for $50 000. The mine is considered one of the most valuable of its kind in tbe country, and at the time of the transfer was the property of the estate of C. Murrillo, A. Viliavicencio, P. Espinoza and J. L. Clark. The mine is located about 170 miles south of tbe line. The new owners will proceed at once to develop the property.

THE Ophir pan mill at the foot of Gold canyon, Nevada, which has been running steadily for the past 15 years, when there was water in the Carson river for power, has closed down permanently. The material worked was tailings from the Consolidated Virginia and California ore pulp flumed there while a portion of the ore from the bonanza discovered in those mines in 1874 was being crushed. The mill handled 130 tons of tailings in 24 hours, and the bullion product therefrom during the entire run of the mill is said to have netted J. W. Mackay & Co. $2,000,000.

Personals.

JOSEPH LOW, the mining operator, has returned from an extended Eastern trip.

COLONEL D. H. JACKSON, superintendent of the Holmes mines, is ill with typhoid fever at Candelaria, Nev.

GEORGE H. BUMP, who is interested in mining properties at Pine Nut, Nev., reports a bright outlook for that district.

ALF TREGIDGO of Grass Valley has been in the city this week on business connected with his electric-power and mining plant.

D. B. HUNTLEY, the Portland, Oregon, assayer and metallurgist, is now superintendent of the Morning mine, at Mullan, Idaho.

JOHN H. TILTON, one of the original locators on the Comstock lode, and father of the first child born at the famous camp, died at Virginia last week.

MR. THEODORE G. ED WOLLEB, the mining expert, who is a resident of East Oakland, left this week for Plumas county to make an examination of a quartz mine.

RUSSELL L. DUNN, the U. S. Deputy Mineral Surveyor of Auburn, Placer county, is at present in Siskiyou county engaged in fieldwork for the State Mining Bureau.

E. A. STENT has sold his quartz mine at Salmon river, about five miles from Sawyer's Bar, to C. J. Clark, who represents the Gladstone Company of Shasta county.

WILLIAM P. SHAW, the silvermine-owner who is interested in sinking six or eight artesian wells near Nevada, has returned from the Cortez mining district in Nevada, where he has been for some time.

ERNEST BEYER, a mining man of Tombstone, Arizona, has purchased a fruit farm near Petaluma, in this State. He says the refusal of Congress to take action on the silver question has greatly depressed the mining industry in Arizona.

C. N. LAMBERT is now associated with ex-Representative Morelock of Linn county, Oregon, in the management of the old Ganiard mill near Gold Hill, Oregon, and they have put in a wheel to supply water for the approaching milling season.

WM. P. BLAKE, now at Shellsburg, Wis., put up the first rockbreaker in California, in the Benton mill, Mariposa county, in 1861. He also introduced the machine as an adjunct to stamps at Land's and Booth's mills for crushing Comstock ore.

A. L. COLTON has been appointed secretary and assistant astronomer at the Lick Observatory. Mr. Colton has recently been connected with the Weather Bureau, and received his instruction in astronomy under Professor J. M. Schaeberle at Ann Arbor.

Mr. B. F. LACY, president of the Parke & Lacy Co., who went to Australia last March, is still in Sydney, and will not return to California before October. The company has a branch house in Sydney, where they do a large business in mining machinery, etc.

JOS. NORTHEY, Jos. G. Northey, Benj. Hall and Wm. Black bave formed a copartnership for the purpose of working sulphurets at the Pioneer Reduction Works, Nevada county, which property will pass into their hands at the expiration of Fred Bost's lease.

M. C. CREEDE, whom the mines of the new camp in Colorado have made a millionaire, is a native of Illinois, who went to Colorado 20 years ago and has since been prospecting all over that State. He is described as "the most genial and unaffected fellow in the whole diggings."

B CHANDLER, an experienced Pennsylvania petroleum oil man, now a resident of Los Angeles, is in the city. He and George J. Ainsworth and others of Oakland have just secured a tract of several thousand acres of Contra Costa county land, on which they will soon begin boring for oil.

ARTHUR GRIGSBY had the fingers of his right hand injured in the machinery while working about the engine in the reduction works of the Palisade mine, Napa county. The two middle fingers were badly crushed, the bones of one being broken, and amputation may become necessary.

THE new concentrating plant of the Harney Peak Tin-Mining Co., South Dakota, was planned and constructed by George Labram (of the firm of Fraser & Chalmers, Chicago), with the assistance of J. S. Childs, superintendent of the Harney Peak Co. The machinery is intended to treat 250 tons a day.

MR. FRANKLIN BALLOU and his associates have made some improvements on the Austin hot-blast process, just being applied at the new Bi-Metallic smelter at Leadville. D. H. Moffatt and others own the patent rights for Lake county, Colo. The furnace with all its appliances was built at the Colorado Iron Works, Denver.

GEORGE ATTWOOD, son of Melville Attwood, of this city, has for several weeks past been examining the mines of the Slocan, Lake county, and the vicinity of Golden and Revelstoke, British Columbia, for leading officials of the Canadian Pacific railroad. He predicts the rise of a number of good camps there.

E. SCHEFFELIN, a mining man well known all over the State of California, Arizona and Alaska, is about to remove for a time to Oregon, where he has mining interests. Mr. Scheffelin was the discoverer of the mines at Tombstone and made a large amount of money in connection therewith, a portion of wbich he invested in gilt-edge Alameda property.

G. F. BECKER of tbe U. S. Geological Survey, and in charge of tbe division of California for surveying the gold belt, left suddenly for Washington last week, leaving four parties at work here. Prof. Becker is one of the chief geologists of the survey, but the lack of appropriations this year will necessitate the withdrawal of several of them. Whicb geologists will remain in the service Major Powell will determine.

The Geographical Society of California.

Although not incorporated until December, 1891, the Geographical Society of California has lost no time in taking a prominent place among the scientific organizations of this State. With a daily increasing membership amounting to 350, there is already a goodly number to contribute to the lectures and bulletins, and the active work done thus far augurs well for the future advancement of the Society. The acquisition and dissemination of geographical knowledge are its permanent objects, and for this purpose lectures are given either by native or foreign travelers or by qualified scientists. Information is received from naval officers with regard to points of geographical interest, changes of currents, climatic variations, etc., and a record kept for consultation. A library of books of travel and other kindred subjects, together with maps, is being also rapidly accumulated. The following lectures have so far been delivered before the Society: "Somali Land, or the Eastern Horn of Africa," (with stereopticon views), by J. Studdy Leigb, F. R. G. S.; "The Yellowstone Park," by Prof. David S. Jordan, president of the Leland Stanford Jr. University; "Holland and Belgium (with stereopticon views), by Edgar D. Peixotto; "Egypt" (with stereopticon views), by Hon. Jno. E. Sandstrom; "Arabia," by Col. John O'Byrne; "Brazil" (with stereopticon views), by Dr. John Branner, Professor of Geology Leland Stanford Jr. University; "Volcanic Region of New Zealand," by Thomas Crawford Johnston (illustrated with 100 very fine views).

A bulletin will be published very shortly by the Society which will contain a paper by Thomas Crawford Johnston embracing the "Origin of the Aztecs," the invention of the mariner's compass 200 years before the earliest date commonly assigned to it, and the discovery of America at least 2500 years before the arrival of Columbus, all of which he ascribes to the Phœnicians. Mr. Johnston first communicated his discoveries to his friends on the 19th of April last, and they are now to be published. On the 24th inst., at Union Square Hall, Prof. Jordan will deliver a lecture entitled "A Neglected Naturalist—Constantine S. Rafinesque." The membership fee in this Society is $10, and monthly dues $1, but associate members not taking part in the management pay $5 per annum. The life membership fee is $100. The rooms of the Society are in the Academy of Sciences building on Market street and the officers are as follows: President, David Starr Jordan, M. D., L. L. D., PH. D. (president of the Leland Stanford Jr. University); vice-presidents, Fred. W. D'Evelyn, M. B. C. M., Edin, Colonel John O'Byrne. Directors—George W. Davis, M. D.; Wm. Ham Hall, C. E.; George A. Moore, Henry F. Emeric, Peter MacEwen, Edgar D. Peixotto, Hon. W. H. Pratt, U. S. Surveyor-General; treasurer, R. H. McDonald, Jr., vice-president of the Pacific Bank; secretary, J. Studdy Leigh, F. R. G. S.; bankers, the Pacific Bank.

Quicksilver in California.

Up in Sonoma county there is quite a revival in the quicksilver-mining industry. The Crystal mine, near the Pine Flat region, has been bonded for $6000, and several other claims, which have been practically abandoned for a long time, are being reopened and development work pushed. The Cinnabar King mine, owned by a corporation composed of residents of Healdsburg, has lately struck a vein of cinnabar that assays well, and the stockholders are confident that it will be but a short time before they will open a valuable mine.

The center of the quicksilver mining industry of California has, within the past year, shifted from the south to north of San Francisco. The practical stoppage of work at the famous New Almaden mine took from Santa Clara county the lead in this product. Now the counties of Napa, Sonoma and Lake are turning out the bulk of the quicksilver produced in this State. During the boom in quicksilver, a number of years ago, many small claims were opened and operated in these counties, but on the price of the metal declining, all but the larger ones closed down. Since the great falling off in product of the New Almaden, the owners of these claims have concluded there was some chance for them, so that the old claims are being reopened. In Trinity and Siskiyou counties and in Southern Oregon, there are claims which merit attention, some of which are being worked. The price of the metal is unchanged, remaining at about the same figure it has for a long time. Should, however, any number of the smaller mines again be reopened and worked, there might be a change in the market value of the product, although there is not very much money in this class of mining with the price lower than it is now.

The White Hills, Arizona, has already become so civilized as to boast of a lady barber, the only one in the Territory.

The Mines of Amador County.

From Our Traveling Correspondent.

TO THE EDITOR:—Amador has always occupied a prominent place in the list of California's mining counties. Being an old mining county many of her mines have either been worked out or reached that stage where it was no longer possible to work them to a profit. But the closing down of these old mines after a production of several millions has been closely followed by the opening of other mines their equal, until now it is thought, and to some extent proven, that it is but necessary to sink to 500 feet and drift to secure a mine on the mother lode of Amador. Beginning at the east the first mines encountered are in the vicinity of Jackson.

THE ZEILE.—The old Leila has been run without interruption for 13 years past and still bolds several years' dividends. At the time that Mr. W. F. Deitert, the superintendent, took charge, the mine was opened but not developed. Shafts had been sunk and levels run, but no vein encountered in the lower works. Mr. Deitert's practiced eye soon saw where to drift and in a short crosscut showed up 40 feet of quartz in the lower levels. Although the ore is low in grade, running from $3 to $4, under Mr. Deitert's management the 40-stamp mill has been pounding out a steady profit to the present depth of 1160 feet. The Zeile is the only property working in the immediate vicinity of Jackson. Above Jackson, on the road to Volcano, the Clinton Consolidated, with Mr. John Francis, superintendent, is dropping its 30 stamps, but owing to the wretched condition of the road hetween Jackson and the Clinton, I did not visit the mine at this time.

THE KENNEDY.—J. Parks is the superintendent of this claim. As the Kennedy is the banner mine of the county, and its situation is beyond Jackson as you drive to Sutter Creek, both towns claim it, though it is but a short distance from Jackson. The Kennedy is now down 1550 feet, with every evidence of continuing for years to come. Drifts have been run for 1200 feet on the vein, thus determining its value throughout that distance. The largest shoot of ore is in the south end and averages 250 feet in length by 15 feet in width. In the north end the vein is small and the gold concentrated, thus giving one ton the gold value of 20. The Kennedy is a steady producer of large-sized dividends, and is at the head of the mines of the State in the size and number of its dividends. One of the best evidences of the mine's value is the fact that there is no stock for sale.

Just below the Kennedy mill is the blanket system of the inventor, Mr. Geo. Gates. This plant is, without a doubt, the most complete and convenient, and for rapid, economical and effectual work I douht if its equal can be found. The system differs from the usual blankets in the "cut-offs," or short cuts, and conveniences for saving time and labor, and the more effectually saving the valuable contents that escape from the mill. After passing over the blanket system the concentrates feed on to a concentrator of Mr. Gates' invention, where they are recleaned. The concentrator does good work and is perfectly noiseless.

SOUTH EUREKA.—Mr. J. Parks is in charge of the South Eureka. On this property can be seen the evidence of the faith in gold values of the mother lode of Amador county. Here was a piece of ground without a single cropping, and yet capital was eagerly subscribed to develop the property. A survey was run from the mines to the north and south. The lines did not join and the distance between was divided and the shaft put down 500 feet. A crosscut was then driven west in black slate, which is now in 210 feet, and then a crosscut was run east 188 feet, until the contact was reacbed, when a drift was started north and a five-foot vein of gold-bearing quartz encountered, which is now being drifted on. The nerve displayed by the promoters and stockholders in the South Eureka is the hest display of "sand and soap" to be found in the State, and those back of it deserve all the success that now seems to be in store for them. In time the whole length of the mother lode will he developed in the same manner, and as mine after mine is added to the list, capital will the more willingly embark in these prospecting ventures.

SUTTER CREEK.—The well known iron works of Knight & Co. are situated here. Mr. Knight has recently purchased the old Donnelly foundry, with all of its machinery, and is better prepared than ever before to turn out first-class mining and milling machinery of every description. These works manufacture the old and well known Knight water wheel, hydraulic engines and complete mill and mine plants.

THE WILDMAN—John Tregloan, superintendent—is now down 900 feet, with a six-foot vein, and only wants the shaft put down and levels run to bring it into bonanza. The mine labors under a great disadvantage in being operated by a single shaft and that by hucket. Given another shaft and skips, Mr. Tregloan could work all of the mine's low-grade ore to a profit. That the mine does so well, handicapped as it is, is the hest evidence of the ability of its superintendent. The mine has a fine surface plant, with a 30-stamp steel mill. Its steel shoes, dies, cams and tappets make the mill send out a roar not equaled by an iron mill of 60 stamps. In fact, I have never been in a mill which can equal the volume of its roar, and I have been in all the large mills of Dakota.

THE HECTOR.—G. T. Taylor is superintendent and S. D. Valentine manager of this property. It is better known as the Old Mahoney. The mine is now the property of Valentine Bros. & Finch. The shaft is now down 700 feet and the old 600 foot level opened up. On this level there has been no ore stoped, and tbe vein here runs from 50 to 75 feet in width. The mill is of 40 stamps, all of which will begin dropping September 1st. The hoist on this mine is new and novel. The machinery is from the shops of Knight & Co. Instead of the old system of setting the water-wheel on a separate shaft and then belting to the hoist, Mr. Knight here placed two of his nine-foot wheels directly on to the shaft that carries the cable reels. The wheels are set so as to reverse the motion, and, to date, the machinery has been found to give entire satisfaction. Messrs. Valentine took hold of the mine when she was about abandoned, cleaned out the old shaft, and put the mine in its present shape. Everything indicates that under their management tbe mine will prove to be a very valuable property.

The Lincoln is idle, but will, when handled like the Hector, prove its value.

THE BELMONT, J. H. Tibbits, superintendent, has now a fine shaft down 220 feet. The vein is here eight feet in width. The mill of ten stamps will be started as soon as drifts and upraise are completed, and a good hoist will follow. Mr. Tibbits is proceeding slowly with his work, making sure of his footing as he proceeds; and though apparently slow, in the end it will be satisfactory.

REDUCTION WORKS.—Midway between Sutter Creek and Amador City is situated the Amador Reduction Works of Messrs. Voorhies & Barney, who are also the proprietors of the Phœnix Reduction Works at Drytown. The first-named plant is one of the most complete in the State, and is under the charge of Senator Voorhies. This has a capacity of 4½ tons of sulphurets a day. The works treat a large quantity of sulphurets, working them up to a very high percentage. The Phœnix plant is in charge of Mr. Barney. While this plant is not as large as those of Senator Voorhies, the work done here is equal to that of the other works. To these works is due in no small measure the financial success attending mining in this county.

THE WABASH.—This property, at Amador City, is north of the Belmont and south of the South Spring Hill. A crosscut tunnel has recently been run on this mine and a very fine vein of gold-hearing quartz encountered. Its situation is such that it is safe to predict that when developed it will prove to be a valuable property.

SOUTH SPRING HILL.—The shaft is now down 900 feet and the mine very thoroughly developed to this depth. The 40 stamp mill is pounding away regularly, while the Frue, Triumph and Woodbury concentrators sit side by side elbowing each other in trial for the supremacy. J. R. Tregloan is superintendent of the mine.

THE KEYSTONE.—The old Keystone, E. T. Hale superintendent, has held the arch with a production of over $7,000,000, and Mr. Hale is delving away in the old workings for neglected or hidden treasures, keeping 25 of the 40 stamps dropping. Mr. Hale has put in modern concentrators and left nothing undone to lessen the expense and increase the income of the mine. On the Keystone is to be found a mining timber framing machine, the patent of Mr. Isaac Lepley, which, if it were but known, would be generally adopted wherever there is a large amount of timbers to be framed. The timber is fastened on to a car which is brought forward by a lever. The framing machinery, which is a cutter head, is then brought up one side of the timber, over the top, down the otber side, and back under the bottom, thus framing all four sides of the end at one time, and that in less time than I can describe it. The machine has been in operation on this mine for a number of years, and is also used on the Zeile and at a mine at Bodie. It will well repay any mining operator to inspect the machine, as the framing of one timber will suffice to convince the most skeptical that Lepley's mine timber framer is as great an advance over hand framing as the power drill is over the hand drill.

QUARTZ MOUNTAIN.—The mines of this section are located about 1¾ miles east of Amador City and the mother lode. The quartz crops very strongly all along the summit of the ridge, hence the name. The mining thus far has been principally by short open cuts and tunnels in the grass roots. The vein there is from 5 to 15 feet in width, of a ribbon character, with a very small per centage of galena. In this surface rock the percentage of sulphurets will run from nothing to 10 per cent, with a small average. This, however, is counterbalanced hy the high value of the sulphurets, which assay from $400 to $1800 a ton. If a shaft were put down on this vein to 500 feet, there is everything to show that the vein would prove very valuable below water level. Tbe vein is of that character that would increase its free gold and sulphuret values tenfold, once the vein was opened to live rock. The present free gold value of $1.25 would no doubt increase to $10, while the percentage of sulphurets, wbich is now less than one per cent, would increase to at least 2½ per cent. The principal operations on the vein are located on the ground of the Gold Mountain M. Co.

THE GOLD MOUNTAIN.—On this location a series of open cuts have been run near the surface and a vein opened which runs from 5 to 25 feet in width. In some of the openings the vein has broken over and lays flat, thus giving it the appearance of being very wide. The rock carries bunches or streaks of quartz which are very heavily mineralized. The quartz is fine, dry and granular, with a ribbon structure. From these surface works the rock is hauled down the hill to a mill hy tramway about 1200 feet long. At the mill 20 stamps are erected. Two of the batteries are of the all-iron patent of the Pacific Iron Works. These are open at both sides and hoth ends, only closed at the corners. This style of battery allows the pulp to escape as fast as crushed; which prevents the galena from sliming and increases the battery's output to 50 per cent more than the adjoining single discharge battery. After leaving the battery tbe ore is fed on to six-foot Frue and seven-belt Woodbury concentrators, two to each battery. Below the batteries there is arranged a blanket and tank system to catch the fine mineral that may escape from the concentrators. The mill will undoubtedly do good work on this class of ore and once the mine has a shaft put down on the vein 500 feet and a direct automatic tramway from the shaft down in a direct line to the mill, the property will come to the front as one of the best in the county.

Adjoining this mine are a number of other locations which promise equally well. On one of them, the Goodwin, Mr. W. G. Whorf has driven a crosscut tunnel and showed up a good vein, but the mine is tied up in litiga-

tion. Given depth, this is a good vein, but I doubt if the present surface workings can be made to pay expenses. Amador county's mines have never got into bonanza until about 1000 feet deep, and that is what this vein wants—depth.

The old Bunker Hill has closed down. The superintendent was out of town, and, in consequence, I could learn nothing reliable as to its possible future.

THE GOVER.—A. B. Call is superintendent of the Gover which is about an equal distance from Amador City and Drytown, and is the only mine in operation in that section. The mine is now opened 1140 feet, or 140 feet below the old workings. The width of the vein in the old workings is 15 feet, of fair-grade ore that carries, in addition to its gold values, about 3½ per cent sulphurets of an assay value of $109 a ton. The top of the shaft has been remodeled and self-dumping skips put in. The most interesting feature of the mine is its electric-pumping plant, which throws a continuous stream of 12 inches of water which flows as regularly as though it were a babbling brook. The mill is of 20 stamps. An extensive system of blankets and sluices extends beyond the mill, which, with the settling tanks, allows very little to escape.

PLYMOUTH.—Old Plymouth is dead. The New London plant has been removed to the Raw Hide mine, Tuolumne county. The old Empire and Plymouth mines lie idle—a relic of bygone days. At the time of the fire in January, 1888, the Plymouth was paying a regular monthly dividend of $15,000. The fire closed the mine for eight months. The mine was opened in 1889 and the water had risen and put the fire out. The mine was reopened into the old ground and worked to a profit for eight months, when the mine caved, leaving possibly a year's supply of good quartz in these old stopes. After the cave the mine was opened south and the ore bodies encountered worked out, and the old mine closed down for good August 1, 1892. During the life of the mine the property paid dividends of over $4,000,000. As the mine did not pay above the 1000-foot level, and everything went for expenses, it is very safe to say that the total output of the mine exceeded $10,000,000.

THE BAY STATE.—W. T. Jones is president and general manager of this mine. The Bay State is on the southwest bank of Indian creek, near its junction with the Cosumnes river, three and one-half miles north of Plymouth, and is on the mother lode. The mine was first located by a miner named Philips; then sold to Maguire; then to Poundstone; and then secured by Mr. Jones, who organized a local company to develop the property under the title of the Bay State Mining and Developing Co. A shaft was started 40 feet back of the vein in the foot wall, and sunk on the pitch of the vein 300 feet. A crosscut was run 25 feet to the channel of the vein which was crosscut and at 124 feet the contact on hanging wall was struck. A drift was then started and run south 50 feet on the foot wall; here a stringer of quartz three inches wide came in, which is gradually increasing, until at 100 feet from the crosscut it has widened out to five feet of a very fine ribbon quartz which samples $8 a ton, and at the time of my visit was showing very nicely in visible gold with the vein rapidly increasing in width. A drift was run north on the foot wall and at 25 feet ribbon quartz came in, about three inches wide, and was run on for 45 feet, when the quartz had increased to three feet in width. The quartz is the same in character and appearance as in the south drift and samples $6 a ton. As this is only 300 feet deep, the owners feel that once they get down below the 1000-foot level they will have a mine in size and value equal to the old Plymouth. Mr. Jones will continue on out on the present drifts until there is sufficient quartz in sight to feed a mill, when it will be erected and the shaft continued on down. The mine owners are fortunate in the position of the property, as a fall of 325 feet can be secured, for pressure and water can be secured from the Plymouth ditch. It would look as though now it would be but a question of development to make the Bay State one of the best mines in the county, and the writer sincerely hopes that the good people of Plymouth who have invested their little private store of wealth in prospecting the Bay State may see their fondest dreams realized and Bay State stock command $10 a share. E. H. SCHAEFFLE.

Local Labor Unions.

THE different unions of the city are making preparations for their annual Labor Day parade, September 5th.

THE Horseshoers' Union reports that nearly all the bosses are now employing only union men in the shops. There are only two or three small concerns which employ nonunion men.

THE Granite-cutters' Union has installed the following named as officers: M. Becklay, president; M. Mondt, vice-president; Alexander G. Craig, secretary; W. Thomas, financial secretary; W. Donald, treasurer.

THE new organization known as Wiremen's Union, No. 1, composed of the electric-wire layers of this city, met at Drew's hall on New Montgomery street, Monday night, to adopt by-laws and perfect arrangements for permanent organization.

THE Cigar-makers' Union reported to the Council of Federated Trades that trade is very dull and many men are idle in consequence. All union men are requested to buy only white-labor cigars and leave cards requesting the cigar-dealers to sell only that class of goods at each store.

AT the last meeting of the council of Federated Trades, the Coopers' Union reported that the bosses had refused to submit their differences to arbitration. They reported that 110 union men are out of work and that if the trouble is not settled at an early date a cooperative factory will be started.

THE Pavers' Union of this city is in a prosperous condition, and all its members are at work. The new officers are as follows: President, Daniel Dismond; vice-president, Edward Lyons; financial secretary, John Callon; corresponding secretary, M. McMurphy; treasurer, James Flinn, and sergeant-at-arms, Thomas McGrath.

The Cyanide Process.

A Chemical View of It.

SAN FRANCISCO, Aug. 13, 1892.

TO THE EDITOR:—Having read all the literature accessible relating to this new process for extracting gold and silver from refractory ores, and having studied carefully its chemistry and electrical relations in metallurgy, the writer offers some suggestions which will, perhaps, help those interested to understand some of its peculiar features which are most puzzling.

It is claimed by MacArthur that cyanide of potassium dissolves out the gold and silver from base ores *by preference*, leaving the base metals untouched and the appearance of the ore unchanged to the eye. This action, being the opposite of chlorine and other solvents, may be explained by investigating the electro-chemical relations existing between the different metals and their solvents.

All substances bear certain electrical, or magnetic, relations to each other, that is, each one is positive or negative to all others, in a definite degree, and they are so classed by scientific authorities. For instance, the leading elements, as classed by Gore, a high authority, are electro positive or negative in the following order, beginning with the most positive and ending with the most negative, viz.: Potassium, sodium, magnesium, zinc, iron, aluminium, lead, tin, bismuth, copper, silver, mercury, platinum, gold, hydrogen, antimony, carbon, tellurium, phosphorous, selenium, iodine, bromine, chlorine, nitrogen, sulphur, fluorine, oxygen. As a rule, the farther any two of these are apart in the scale, the stronger is the affinity between them, and each is negative to all before it and positive to all following it, in proportion to the distance they are apart.

Cyanide of potassium is composed of two negatives—nitrogen and carbon—together forming cyanogen, which, acting chemically as a radicle, or element, unites with potassium, the positive element of the scale, and forms a solvent in which the positive element predominates. Cyanogen cannot exist permanently by itself and requires potassium, or some other highly positive element, to *fix* or hold it. It is the cyanogen which attacks and dissolves the gold and silver in the ore, but the potassium causes it to seek out the most negative metals and unite with them by preference, because of the stronger affinity of the positive solution for that class. Looking again at the scale above given, gold is the most negative metal and silver next; therefore, the gold and silver are first dissolved by the cyanogen and taken into the combination, forming a double, or triple, cyanide of gold, silver and potassium. Unlike other solvents, cyanide of potassium is not decomposed (but slightly), that is, the gold and silver unite with the cyanogen without displacing the potassium. The latter, probably, takes up a little oxygen and causes a slight waste, or weakening of the solution.

It is proper to state that different solutions change the relative positions, in the above scale, of some of the principal metals. In a cyanide, chloride and some other solutions, gold and silver are negative to antimony, which, in the scale given, is the reverse. So in a strong (12 per cent) cyanide solution, copper, lead and antimony are positive to iron. Here, again, it must be noted that, while cyanogen attacks the most negative metals first, by preference, it does not follow that it will not attack the others also. On the contrary, it will follow up its attacks upon the others in succession, according to their negativeness—that is, if there is enough cyanogen to go around and supply the demands of all. This explains an important feature of the cyanide process, namely, that the solution must be *very weak*, so that there will only be cyanogen enough to dissolve the two metals you wish to capture and not disturb the others. There can be little doubt that some of the failures in trying the process result from using the cyanide too freely.

Other solvents of the precious metals commonly employed, such as chlorine and the acids, attack the more positive or base metals first, all of which have to be supplied with some substance more attractive before they will give up their hold upon their associates in the original or natural combinations existing in the various ores. These common solvents are negative in character, and hence prefer to unite with positive substances. Cyanogen associated with potassium is of a positive character and prefers negatives. These facts suggest that in some kinds of ores, both positive and negative solutions may be advantageously employed, one at a time, to dissolve out the different metals sought for.

Another peculiar feature claimed for the process, as of great economic importance, is that the ore yields almost as high a per cent of gold and silver when crushed very coarsely as when reduced to ordinary fineness for amalgamation. This means that the same power that crushes two tons a day per stamp, using a 30-mesh screen, will crush about three tons a day using a 20-mesh screen, thereby increasing the output 50 per cent. That the percentage of fine assay value is practically the same in leaching the ores of different fineness with the cyanide solution, or any other for that matter, is fully established by long experience with the Russell process, where hyposulphite of soda is used as a solvent. The solution penetrates the coarse particles of sulphurets and reaches the metal sought for, just as the acid employed by the assayer to extract the silver from a button containing both gold and silver penetrates the metal of the flattened button, dissolves out the silver and leaves the gold untouched.

Considering the foregoing facts, and that no concentration, no roasting nor expensive amalgamating machinery is required, the cyanide process certainly has a future before it.

The contamination of the bullion with the zinc used to precipitate the gold and silver from the solution, is unfortunate, but will soon be overcome by the introduction of a better precipitating agent, in due time, by the writer.

M. T.

Care of Tools.

The wooden parts of tools, such as the stocks of planes and handles of chisels, are often made to have a nice appearance by French polishing, but this adds nothing to their durability. A much better plan is to let them soak in linseed oil for a week, and rub them with a cloth for a few minutes every day for a week or two. This produces a beautiful surface, and at the same time exerts a solidifying and preserving action on the wood.

The following recipes complied by *The Tradesman*, are recommended for preventing rust on iron and steel surfaces.

1. Caoutchouc oil is said to have proved efficient in preventing rust, and to have been adopted by the German army. It only requires to be spread with a piece of flannel in a very thin layer over the metallic surface, and allowed to dry up. Such a coating will afford security against all atmospheric influences, and will not show any cracks under the microscope after a year's standing. To remove it the article bas simply to be treated with caoutchouc oil again and washed again after 12 to 24 hours.

2. A solution of indianrubber in benzine has been used for years as a coating for steel, iron and lead, and has been found a simple means of keeping them from oxidizing. It can be easily applied with a brush, and is easily rubbed off. It should be made about the consistency of cream.

3. All steel articles can be perfectly preserved from rust by putting a lump of freshly burnt lime in the drawer or case in which they are kept. If the things are to be moved—as a gun in its case, for instance—put the lime in a muslin bag. This is especially valuable for specimens of iron when fractured, for in a moderately dry place the lime will not want renewing for many years, as it is capable of absorbing a large amount of moisture. Articles in use should be placed in a box nearly filled with thoroughly slacked lime. Before using them rub well with a woolen cloth.

The following mixture forms an excellent brown coating for preventing iron and steel from rust: Dissolve two parts crystallized iron chloride, two antimony chloride, and one tannin in four of water, and apply with sponge or rag and let dry. Then another coat of paint is applied, and again another if necessary, until the color becomes dark as desired. When dry it is washed with water, allowed to dry again, and the surface polished with boiled linseed oil. The antimony chloride must be as nearly neutral as possible.

5. To keep tools from rusting, take half an ounce of camphor, dissolve in one pound melted lard; take off the scum, and mix in as much fine black lead (graphite) as will give it an iron color. Clean the tools and smear with this mixture. After 24 hours rub clean with a soft linen cloth. The tools will keep clean for months under ordinary circumstances.

6. Put one quart freshly slacked lime, half pound of washing soda, half pound of soft soap in a bucket and sufficient water to cover the articles; put on the tools as soon as possible after use, and wipe them up next morning, or let them remain until wanted.

7. Soft soap, with half its weight in pearlash, one ounce of mixture in about one gallon boiling water, is in every day use in most engineer's shops in the drip-cans used for turning long articles brought in wrought iron and steel. The work, though constantly moist, does not rust, and bright nuts are immersed in it for days until wanted, and retain their polish.

8. Mix slowly together six ounces or eight ounces lard to one ounce resin, stirring till cool; when it is semi-fluid it is ready for use. If too thick it may be further let down by coal oil or benzine. Rubbed on bright surfaces ever so thinly, it preserves the polish effectually, and may be readily rubbed off.

9. To protect metal from oxidation, polished iron or steel, for instance, the requisite is to exclude air and moisture from the actual metallic surface; therefore, polished tools are usually kept in wrappings of oil cloth and brown paper, and thus protected they will preserve a spotless face for an unlimited time. When these metals come to be of necessity exposed in being converted to use, it is necessary to protect them by means of some permanent dressing, and boiled linseed, which proves a lasting covering, as it dries on, is one of the best preservatives, if not the best. But in order to give it body it should be thickened by the addition of some pigment, and the very best, because the most congenial of pigments is the ground oxide of the same metal, or, in plain words, rusted iron, reduced to an impalpable powder, for the dressing of iron and steel, which thus forms the pigment or oxide paint.

10. Slack a piece of quicklime with just enough water to cause it to crumble in a covered pot, and while hot add tallow to it and work into paste, and use this to cover over bright work. It can be easily wiped off.

11. Olmstead's varnish is made by melting two ounces resin in one pound fresh, sweet lard, melting the resin first, and then adding the lard and mixing thoroughly. This is applied to the metal, which should be warm, if possible, and perfectly cleaned; it is afterward rubbed off. This has been well proved and tested for many years, and is particularly well suited for planished and Russian iron surfaces, which a slight rust is apt to injure very seriously.

RUST REMOVERS.

1. Cover the metal with sweet oil, well rubbed in, and allow to stand for 48 hours; smear with oil applied freely with a feather or piece of cotton wool after rubbing the steel. Then rub with unslacked lime reduced to as fine a powder as possible.

2. Immerse the article to be cleaned for a few minutes, until all the dirt and rust is taken off, in a strong solution of potassium cyanide, say about one-half ounce in a wine glassful of water; take it out and clean it with a tooth-brush with some paste composed of potassium cyanide, castile soap, whiting and water mixed into a paste of about a consistency of thick cream.

Practical Suggestions to Young Woodworkers.

Since the care and management of wood-working machinery has become recognized as a trade, the young man who intends to adopt this as his business should look upon it in the same light as any other trade or profession, and make up his mind to become, as far as possible, familiar with all the machinery that belongs to this class, so that he may be able to successfully manage any machine that may come into his hands. The time has gone by when it was considered that any intelligent man or boy could in a few days or weeks make himself sufficiently familiar with a planing machine or a molding machine to make it a success. It is true that many such men, after stumbling along for a few months, and spoiling any amount of good lumber, with probably several breakdowns, have at length become passable operators; while others have succeeded in losing a few fingers or perhaps a hand, and abandoned the business in disgust.

But at the present time, with the increased value of lumber and the more complicated and expensive machinery, the proprietors of planing mills and other wood-working establishments find it to their advantage to employ none but competent and experienced men to take charge of and manage the machinery of an ordinary mill.

The time was when the fact of a man being a carpenter or other wood-workman was a sufficient recommendation to warrant him in applying for a situation as a planing mill foreman; and while his previous knowledge of carpenter or joiner work might be of some advantage to him in judging of the quality of the work performed by the machine, yet without a practical knowledge of the use of machinery, his previous knowledge, so far as keeping it in a proper condition to turn out the work, was of but little consequence, and he might as well have been a mason or a machinist.

It is not necessary that a man who learns the business of a woodworker should he a carpenter or a cabinet maker. The term woodworker is only applicable to those whose business is to work wood by the use of machinery. There is a wide difference between a wood-workman and a woodworker. A wood-workman is one whose business is working in wood principally by the use of hand tools, and he may be a joiner, a pattern maker or a piano maker; and while each one is a wood-workman, yet a joiner may not understand the first principles of pattern-making, nor the pattern maker the first principles of piano-making. But with a competent woodworker, one who thoroughly understands the care, management and use of wood-working machinery, it matters little to him whether he is employed in the planing mill, sash and door factory or a furniture factory; the principal machines are common to each, and if he can run a planing machine or a molding machine successfully in one place, he can, with equal success, run the same machines in another. All he requires is patterns or drawings to work to. Therefore, in order to become a good, practical woodworker, it requires as much mechanical skill and ability as any one of the mechanic arts.

It is a fact that is well known to all planingmill proprietors, as well as proprietors of other wood-working establishments, that first-class men who are capable of taking charge of and managing successfully the machinery of a mill are not plenty, and the few, comparatively, who are such, command large salaries. This arises from the fact that but few young men at the present time are willing to spend the necessary time in serving a regular apprenticeship and working for apprentice's wages. The fact is, a young man who goes to work in a planingmill, for instance, is not willing to work but a few months before he wants the same wages as the other workmen; and that being the case, the proprietor or his foreman must necessarily put him upon such work as will enable him to earn it, and the consequence is, he learns but little about the business. Or if he is put upon some machine and given a certain class of work, he may learn this one thing; but so far as the general practical knowledge of wood-working and other machinery of the mill is concerned, he is no better off than if he had worked in a shop where there was no machinery at all.

Again, if he should leave this mill and go to another, unless he was lucky enough to find the same work and the same kind of machine, he would be little better than a green hand.

If a young man intends to become a woodworker, and make that the future business of his life, and become competent to take charge of a mill should a situation of that kind offer itself, he must expect to serve an apprenticeship in the same manner as he would if he were to learn the trade of a patternmaker or a machinist; and certainly no young man would expect to obtain journeyman's wages while he was learning either of those trades, or of completing his apprenticeship in a few months. The first and one of the most important branches of wood-working is to became a good sawyer. This not only consists in being able to cut up lumber economically and to the best advantage, but also in keeping the saws, as well as everything else pertaining to the machine, in perfect running order. A good sawyer may always be known by his saws. The teeth will be kept in proper shape, and few if any "beauty spots" will be found upon their sides. The planer should be the next machine to learn the use of; not only in being able to feed the stuff to it correctly, for that part can he learned by any intelligent laborer in a few days, but in fitting up the necessary tools, adjusting the several parts so as to obtain the best results, the care of the belts and boxes, and, in fact, everything pertaining to the machine that is required to keep it in first-class running order. All this, of course, will be done under the direction of a careful and competent foreman, and what is applicable to the planer is equally so with all other machines.

Right here I will say, although it has been often stated that planingmill foremen are averse to showing or teaching young men these points, yet in my extensive acquaintance with planing-mill foremen in all parts of the country I have never yet found a case where an intelligent and competent foreman has refused to impart all the necessary information to an apprentice who was faithful to his employers and anxious to learn. And those complaints generally come from a class of young men who expect to learn the whole business and obtain journeyman's wages in a month or two, and at the end of that time or before know more than the foreman, who has had perhaps 20 years experience, and yet is still able to learn something every day.

It is no wonder that the foreman sometimes loses his patience with such men. But whose fault is it?—G. R. Tompkins, in the Lumber Worker,

The Rose Mine, Morongo District.

Last Friday morning a Riverside *Press* representative, in company with G. A. Fudickar and J. W. Roberts, started from Bear valley for a visit to the Rose mine, in the Morongo district. The distance is 20 miles, over a very good mountain road. Reaching the mine we were most cordially received by D. A. Wheeler, superintendent, and family, and W. B. Taylor, assayer and mill manager, who showed us all over the mine and mill and explained everything to us. They were all feeling very jubilant and happy, for that very day the miners had struck a wider and richer body of ore than any previous ones. We went down in the mine, and on the 115-foot level, about 200 feet from the main shaft, examined this rich ledge, which was on that day nine feet wide and growing larger the farther they went. The main shaft, which is at an incline of 35 degrees, is down 200 feet. At that depth a level is to be run to strike the ledge of rich ore found above. A large amount of development work has been done, levels run in various directions and shafts sunk, for when they got down 50 feet they lost all trace of the ledge, and for 65 feet farther worked in barren rock. Things looked blue at the Rose mine at that time, and but for the faith and determination of Mr. Wheeler, no doubt work would have ceased and the Riverside owners been out of pocket many thousands of dollars. But Mr. Wheeler kept on, overcoming many obstacles, and at last struck the ledge again. Now there is no question about the richness and large amount of ore in the mine. The ore, which is a dark red in color, is now being taken out much faster than the mill can crush, and five more stamps are to be added.

At present the mill is turning out about $150 a day, 12 hours' run, and it costs about $60 a day to operate the mine and mill. So it will be seen that there is a good margin of profit, even if only about 50 per cent of the gold is saved. Only free gold is now extracted, and about half goes off in the tailings. These tailings, of which there are 1000 tons on the dump, will be run through a concentrator—which is probably in operation by this time—and then the concentrates will either be treated by the cyanide process or sent to a smelter. Nearly all the gold will thus be extracted, doubling the output.

The mill, orehouse, whimhouse, and other buildings are large and convenient and the machinery the very best.

The mill has now five stamps, but is made for ten, and the other five will be put in soon. A concentrator was being put up while were there. Fuel is abundant, as the hills are covered with pine, cedar and oak.

The company has had some trouble about water, as the supply has been limited. But Mr. Wheeler has been developing more lately, and an adequate supply is assured. It is brought in a two-inch pipe across the hills, a distance of two and a half miles, and carried to a couple of large tanks above the mill.

There is a good boarding house where substantial meals are served; quite a number of cabins and tents are scattered around, making a lively little settlement, way off near the edge of the desert.

This mine, owned entirely by Riverside parties, has developed into a rich and well-paying property, and Mr. Wheeler deserves great credit for his perseverance and intelligent labors in the face of obstacles that would have daunted most men. But he was confident the ore was there and he was bound to find it.

The owners of the Rose mine are fortunate in having such a capable and energetic superintendent as Mr. Wheeler, who is also the largest stockholder, and therefore deeply interested in the success of the mine on several accounts. The manager of the mill, W. B. Taylor, has had large experience in running mills in Colorado and New Mexico, and thoroughly understands the business. The foreman of the mine, Mr. Hooper, is an old, experienced miner.

The Morongo district is very promising, and the late strikes in the Rose will draw many to that section. While there Mr. Fudickar purchased a half interest in the "Seneca," a silver mine near the Rose, the ore of which assays from $60 to $100 in silver and $10 in gold.

On our way back we stopped at an onyx mine, owned and worked by B. H. Wright. He has three magnificent ledges of onyx, two being black and one white, each ten feet wide. Some polished specimens shown us were fully equal to the Mexican product so highly prized. Mr. Wright has disposed of some of this beautiful stone at $3 50 per cubic foot at the mine.

That whole country is full of mineral, and no doubt some very rich mines will be discovered from time to time.

DR. C. J. EAMES still maintains that he will locate his "squeezer bloom" iron plant at Roseville, San Diego county, and not in Ventura as reported. As is known, a large proportion of the machinery is already on the ground, including the big squeezer sent from Pittsburg. One furnace is completed at Roseville and two others are well along. The squeezer, however, was nipped in the bud, before it had opportunity to bloom, during the recent cold spell, when attachments and executions fell like a white frost on the whole Roseville iron plant. But the plant was not carried away or dug up, and only requires irrigation and liquidation to set it going.

Ocean Beach Mining on Monterey Bay.

"We have made a practical test of ocean beach mining,' said Dr. F. R. Waggoner to a Sacramento *News* reporter, "and it has proven a much greater success than the most sanguine of our company anticipated."

"What process are you employing in your mining?" I asked.

"The Ball-Norton electro-magnetic separator," replied the Doctor. "Our company is a regularly organized mining company, with president and treasurer, and is called the 'Pajaro Mining Company.' We own about a mile and a half square of ground on the line of the railroad between Santa Cruz and Watsonville, and about a mile from the bay of Monterey. Our mine is magnetic iron ore and gold deposited by the action of the waves in prehistoric years. It is the most remarkable deposit of iron ore in that form on the Pacific coast, and is the only one of the kind known. The Pajaro mining company, of which I am president, has put in a plant for working this ore, or, as it is commonly called, black sand. This plant consists of an electro-magnetic separator, with which we are separating the particles of magnetic iron from the silica and other nonmagnetic matter. Our working test has shown that we can, with this machine, separate the magnetic iron from all other matter up to as high as 72 per cent of chemically pure iron. In the residue, or tailings, if you want to use a mining term, is fine gold which, treated by the wet process of amalgamation, by running through sluices and over plates in a revolving quicksilver pan, returns from $10 to $15 per ton. The separator we now have in operation works 300 tons in 24 hours, 65 per cent of which is magnetic iron and the residue nonmagnetic matter, such as silica and other product in which are the particles of gold.

"Ocean beach black sand has been worked on this coast since the very earliest days of the discovery of gold here. In some instances, miners have made from $2 to $3 a day by sluicing with blankets and burlaps for catching the gold, and sometimes rockers yielded to the industrious worker a fair living. The hot-lead amalgamation process, even, was tried, but it proved a dismal failure. The process was to force the sand into molten lead, expecting that the lead would take up the gold like quicksilver. The effect, however, was that the lead oxidized and volatilized and became litharge, when it fell in imperceptible particles over the surrounding country. Many other processes of amalgamation were abandoned because the magnetic iron in which gold was found 'sickened' the quicksilver and it would not take up the particles of gold. I have been experimenting for the past ten years with various processes, and found them all impracticable. Finally, I dropped on the electro-magnetic separator and it has proven a success. It simply separates by the aid of a powerful magnet. Two drums, composed of wood or paper, with positive and negative magnets turning upon shafts, and with apertures in the drum for the entrance and exit of the ore, are the main parts of the machines. I could explain its construction technically and at length, but it would require cuts and diagrams to properly describe the machine.

"The deposit where we have set up our plant is about 100 feet below the surface and is five feet thick. On top of it is a seamless sandstone nearly 20 feet thick. Above this sandstone is a gray sand extending to the surface. Of course, the question presents itself; how did this immense deposit of magnetic sand containing gold get there? I think it was washed there in prehistoric ages, by action of the ocean's waves. Since then the shore upon which it was deposited has gradually risen, until now it is many feet above the ebb and flow of the tide. Even now the same process of depositing magnetic sand is going on all along the coast, but in a much slower degree than in the earlier ages. Close down to the water's edge may be seen strata of sand, recently deposited, which are six or eight inches thick. Yet in no place around the coast have I seen the strata so thick as around the bay or Monterey. Where the Pajaro mine is situated the bay is formed in such a peculiar shape, however, that the waves have had a splendid opportunity to concentrate their power and dash upon the shore more of the sand from the sea than probably at any other point along the entire coast. The valuable properties of this magnetic iron, however, are the great demand for it in the iron markets of the world. From it is made the best quality of steel. It is free from sulphur and phosphorous and commands $6.50 a ton in the East. As we are at tide water, it can be shipped by sail to Eastern markets at a profit. The cost of mining and separating does not exceed 25 cents a ton, and the supply is practically inexhaustible. Then the gold which will be taken from what we denominate the 'tailings" is an item that must not be overlooked. I think it is the best mining proposition I have seen in California since the days of '49, and the balance of the stockholders think so, too. There are 4000 shares in the company."

THE Gem Marble Company, through C. R. Merriam, has made an application to the Board of Trade, asking that body to assist in raising a bonus of $10,000 to enable the company to locate its works in Oakland. As that city already has a job on its hands collecting a bonus for the Fulton Iron Works, perhaps some other town can accommodate the Gem Marble Co.

A MOVEMENT is on foot, says the San Diego *Sun*, to manufacture water pipes out of redwood strip four inches wide with asphalt in the seams and patent wooden bands holding them immovable. These will be much cheaper than metallic pipes, and will revolutionize things in the arid land region of San Diego county.

MESSRS. MCINTOSH & SHEA have commenced to open up the Industrial mine at Glencoe, Calaveras county. They contemplate putting up a 30-stamp mill as soon as the shaft is cleaned out.

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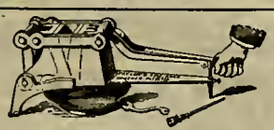

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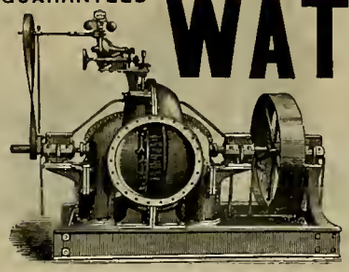

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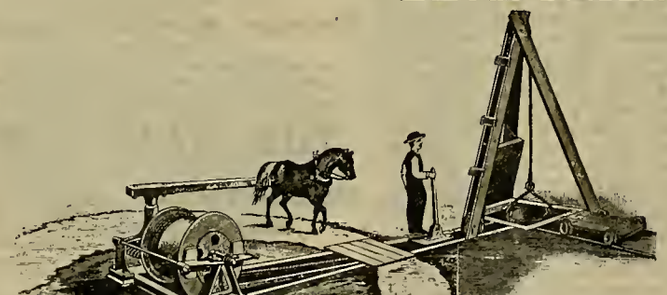

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MECHANICAL PROGRESS.

Foundry Mixtures.

At a recent meeting of the Foundrymens' Association of Philadelphia, Mr. J. M. Warner read a paper on the above subject, from which we make the following extracts :

A more limited knowledge of the chemistry of iron, coupled with a better acquaintance of its physical characteristics, has resulted in very important changes in foundry mixtures in the past five years. These changes have been more important and radical in the West than in the East. Most of the large agricultural machine manufacturers, jobbing foundries, architectural works, etc., which five years ago were using largely of Nos. 1 and 2 foundry, with high-priced softeners, are now making their entire mixture with No. 2 foundry, No. 3 foundry and grey forge, and a little low-grade high-silicon iron. The firm of Rogers, Brown & Co. about four years ago began an exhaustive series of experiments with foundry mixtures. The cooperation of leading smelters of iron throughout the central West was invited and freely accorded. Precise mixtures were given (in confidence, of course), and accompanying these were test-bars of uniform size. Something over 600 test-bars were thus broken, representing about 150 distinct mixtures. The data were very carefully noted and the results have formed the basis of foundry practice recommended by that firm. Some of the largest smelters of iron have readapted their mixtures with the advantage of securing a materially lower cost and a more uniform grade of castings. The old style of foundry practice, which was dependent upon No. 1 foundry for certain favorite brands, is practically a thing of the past, because the foundrymen retaining it cannot longer compete in prices in these days of fierce competition.

Noting in detail the results of some of these tests : The bars broken transversely were one inch square and 24 inches between supports. All tests were made under the supervision of a competent civil engineer. The strongest bar broke at 1923 pounds. It contained Southern coke iron, Ohio coke iron, scrap, and one per cent of ferro-aluminum; it was high mottled and too hard to work. The weakest broke at 840 pounds. It was made of a mixture of 50 per cent each of old car wheels and No. 1 Lake Superior iron, a brand of high standing. These two irons were melted together on account of admitted high strength of each in order to secure very strong castings for special work.

The strongest bar from a pig-iron mixture without ferro-aluminium was 1530 pounds. This was from an all-coke mixture in an Ohio agricultural shop in which only Southern and two Ohio brands and good scrap were used in equal proportions. The general average of all bars broken was 1120 pounds. In deflection, or bending capacity, the minimum was .53 inch, the breaking strength being 1445 pounds. The minimum was ¼ inch, the breaking strength being 845 pounds.

A careful study of the data gathered from these and other experiments by Rogers, Brown & Co. seems to show that red short irons (namely, those low in phosphorus and in silicon, such, for example, as strong all-Lake-ore iron) when mixed together, make castings weak, hard, and given to shrinkage and blow-holes. Cold short irons, or such as are high in phosphorus and silicon, when used alone, tend to weakness and hardness. The highest results are had when different varieties of these classes are mixed in proper proportions. These proportions should be such in ordinary foundry work that the resulting castings should run about 0.75 in phosphorus and pretty close to two per cent in silicon. The safest mixture is one in which the two elements of Lake Superior ores and Alabama ores combine in the highest proportions. In this combination, Nos. 2 and 3 grades may be used without making castings too hard. For example, for good machine castings, architectural work or general jobbing, a mixture of 30 per cent No. 2 foundry and 30 per cent No. 3 foundry standard Alabama iron with say 20 per cent strong Lake ore No. 2 foundry and 20 per cent scrap will give strength, smooth surface, hard lines, freedom from blow-holes and softness for ordinary machine work. If greater softness is required, ten per cent of silicon iron, either Southern or Ohio, will accomplish the result. If little finishing is needed, the proportion of No. 3 foundry should be increased. A mixture of this kind intelligently made as to brands, will give better results than would be had by the use of a strong No. 1 Northern coke iron with No. 1 imported Scotch as a softener.

Mill cinder, which is used to a greater or less extent in nearly all brands except those coming from the South, has a tendency to soften and fluidize the iron, but at the same time it renders it dirty and impairs strength. The use of good scrap where it can be obtained lower than No. 3 strong pig iron, after making proper allowance for difference between gross and net tons, the difference in weight, is always recommended. It multiplies indefinitely the elements in a mixture. It must, however, be bought with care and watched in using on account of irregularity.

A Device for Bending Piping and Bar Iron.

There is in the course of construction at Sheffield, England, a machine which, it is claimed, will bend iron piping and bars of any section, without kinking or flattening them. The bedplate may be attached to any improvised bench by means of four screws. On this bedplate is an upwardly projecting journal, in line with which is a slot, and in this slot may be adjusted at any distance from the center of the journal a stud or burr. A lever with a bifurcated end, in which are fitted a large and a small bending-wheel, both grooved so that when their perimeters are brought together they exactly fit the pipe or bar to be shaped, constitutes the moving part of the apparatus. These wheels are interchangeable for other wheels in bending different sizes of bars or pipes.

The large bending-wheel is passed over the upwardly projecting journal in the bedplate, this journal not only passing through the wheel, but through the bifurcated end of the lever. The smaller wheel is journaled through these counter parts by a pin, which is adjustable to different distances when the large wheel is interchanged. When the lever is turned around so as to abut against the stud or burr, the pipe or bar to be shaped is passed through between the two wheels, and the lever being then turned to a position at right angles with that which it occupied when the pipe or bar was inserted, a right angle bend will be formed. It is stated that the operation of bending requires but a moment, and that the pipe so bent is as smooth as any on the market. By the use of this machine, piping may be also bent in opposite directions, thereby saving fittings in making offsets.

MANAGEMENT OF BELTS.—We watched an engine tender the other day at work on a belt, which showed above all things that he didn't understand the why and wherefore of belts and belting. Some one at one time or another had put in a short piece of rubber belting to lengthen out with, and while the leather part was all right the rubber part gave out and broke at the lace holes. What did he do? asks the Boston *Journal of Commerce*. What he had done before, cut off the ragged edge and laced it up once more, never thinking that each time the belt was shortened the tension upon it when laced increased. Every time he put the belt on it broke in less than a minute, until we suggested a new piece of leather in place of the rubber, and proposed a piece longer than the rubber was originally. "That wouldn't do; it would be too loose." But it did do, and when the load is on, that belt is as slack as it should be on the slack side. This reminds us of another case where we ran across a man lacing a belt and after every effort it broke. It looked like a hopeless task to get that to hold, when at last it went off all right. We had concluded there would be another break, so had some curiosity to see why it did not this time. It appeared that the engineer had failed to secure the lacing when he finished, so the lacing pulled out several holes before it caught and thus lengthened the remainder to fit, practically lengthening out the belt three or four inches. The tension was enough to drive the load, but not enough so as to break the belt. It does not do to have a belt too tight. It ruins the belt and there is a big friction loss also. —Mechanical News.

ELECTRICAL ATTACHMENT FOR ELEVATORS.—The frequency of elevator accidents, due to the doors having been left open, has led an ingenious New York man to devise an electrical apparatus by which it is impossible for the elevator to move until all the entrances to the shaft are closed Each door is connected by a closed circuit with a pair of magnets controlling a lever which, in case a door is open and the circuit thus broken, will come in contact with projections on the starting wheel, thus preventing the operation of the machinery. Not until the door is closed, making the circuit complete again, will the lever be withdrawn from the projections and allow of any movement of the starting gear.

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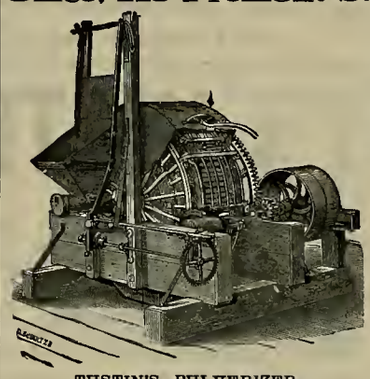
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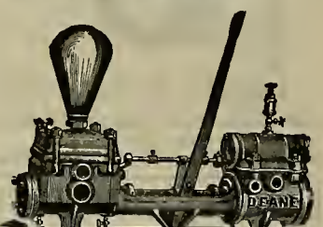

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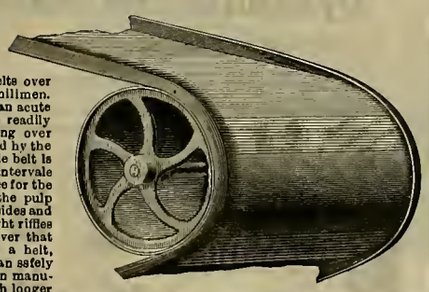

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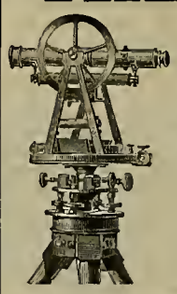

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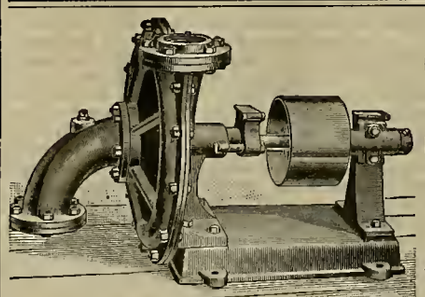

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SCIENTIFIC PROGRESS.

Women Fellows.

The Royal Geographical Society has decided to admit women as Fellows. For many years the society has accepted papers from women, and on two occasions has singled them out for special honor, as when in in 1860 Lady Franklin received the gold medal in commemoration of her husband's discoveries, and when in 1869—a case more to the point—Mary Somerville received the Patron's medal for her publication furthering geographical science. The *Manchester Guardian* for July 7th has the following excellent comment on the decision:—"Papers by lady travelers have frequently been read before the society, and it has for some time been felt to be an anomaly that travelers of the standing, say, of Mrs. Bishop (Miss Isabella Bird) should be excluded from the ranks of a society for which they have done so much good."

While endorsing all this it must be admitted, says *Natural Science*, that there is the strongest objection to the admission of women to scientific meetings as casual visitors; it would probably be advisable to allow only the lady Fellows to introduce ladies, as meetings of a society held for scientific business are very different from Royal Institution lectures.

We do not remember that any society has refused to accept a paper from a woman because she has the misfortune to be a woman, but while accepting her work, most societies refuse to allow her to be present to hear it read. The Zoological Society's principle and practice on the subject are inconsistent: the former admits women as Fellows, "with the same privileges, and under the same regulations in all respects as gentlemen," but while the rules admit women the doorkeeper excludes them from the meetings! The Geologists' Association still maintains its lead in this matter, for it has this year elected a woman whose work ranks high, a vice-president. The Geological Society, however, still refuses women the Fellowship, though it is reported by *Research* (vol. i., 1889, p. 216) that when the subject was last discussed, the reform was only lost by four votes; and, but for the over-confident zeal of the women's advocates, who refused any compromise on the lines suggested above, it would, doubtless, have been carried.

Pumping Hot Water.

A correspondent of the *Engineering News* writes as follows: Is it a fact that the appliance known as the "steam syphon" will not operate in hot water? If this is so, please explain through the columns of the *News* the reason for it; also please inform me as to what is the lowest temperature in which it will operate. Why does not the stream of cold water coming in contact with the steam condense it and cause the atmosphere to force the water back, thus filling the partial vacuum occasioned by the condensation?

To these questions the editor of the *News* makes the following response: The "steam siphon" is not properly a siphon at all. True siphons started into action by a steam jet may be, and doubtless have been, constructed, but what is more commonly known as the "steam siphon" is also and more properly called an ejector or steam jet pump, and these names correctly indicate the action.

Like any other pump, the ejector cannot lift hot water to as great a height as it can cold water. The reason for this is that as the pump reduces the pressure on the column of liquid in the suction pipe, it lowers at the same time its boiling point. If the reduction of pressure be great enough, the boiling point may fall to or below the temperature of the water in the suction pipe; and when this happens, the water gives off steam, which fills the space caused by the upward motion of the piston and leaves the water stationary. Evidently the hotter the water to be pumped the less the possible lift, and this is true whatever type of pump is used. The limits of temperature vary, depending chiefly on the lift and on mechanical construction.

There is, however, an additional reason why the steam ejector will not operate in hot water. It is necessary to the successful operation of every form of apparatus for pumping liquid by a steam jet that the steam should be condensed at a certain point in its flow, otherwise the pipe may be filled with a mixture of steam and water, and the steam may even flow back into the suction pipe.

For this reason steam jet pumps work at a higher duty as the temperature of the water which they handle decreases. If the water to be pumped is at a temperature too high to condense the steam from the jet, the pump may refuse to work at all. We believe, however, that some makers of steam jet pumps supply a special form of pump for handling hot liquids, in which a small auxiliary stream of cold water is used to condense the steam at the proper point.

Plate Glass Casting.

The U. S. Consul at Antwerp, in a report on plate glass manufacture in Belgium, states that the crucibles used are made of Andenne plastic earth, oval in form, having a width of 1.3 by 0.7 meters, a depth of 0.7 meter and a thickness of about 8 centimeters.

Each oven can contain two crucibles, which form one flux. The ovens are heated by cyanogen gas. The mixture of Silician sand and sulphate of soda is only introduced into the crucibles when they are at a full white heat.

The refining and transformation of the excess of sulphate of soda which might remain is produced by the addition at the end of the operation of a certain quantity of coal dust, which transforms this excess of sulphate into sulphite of soda, which abandons its sulphurous acid and becomes silicate of soda.

When the refining is terminated, the oven is allowed to cool for about five hours, so that the matter may become sirupy. By the aid of mechanical cranes and nippers, the crucibles are raised and carried over the flux tables, upon which the matter in fusion is poured.

The flux being made, a hollow, cast-iron roller of 15 centimeters diameter, length equal to the width of the table, and weighing about 700 to 800 kilograms, is passed rapidly over the matter during the time for the matter to assume a consistency capable of bearing a weight of 3000 kilograms minimum, which can compress without extending it. The smaller roller is then replaced by one of cast-iron, turned and polished, with a diameter of about 50 centimeters, its length equal to the width of the table, and weighing about 3000 to 3500 kilograms. By a mechanical contrivance, the roller moves rapidly over the matter until it is cold.

The baking ovens have a perfectly smooth and level bottom of about 8½ by 4½ meters, the vault which covers them having a bend of about 60 centimeters, the whole built of refractory material able to stand a minimum heat of 2000° C. during 60 to 72 hours, heated by cyanogen gas. The ovens being cold, two plates are placed, by means of cranes and chains, in each oven by sliding directly from the table. The ovens having been hermetically closed, the temperature is gradually raised to a minimum heat of 2000° C. and maintained at this temperature for 48 to 60 hours. The cooling process is made in the same gradual manner. The interior of the oven having arrived at the temperature of the surrounding air, the two baked plates are each moved upon a platform moving upon rails, which carries them to the cutting-room, where, by the aid of diamonds and strong nippers, the division is made to the required dimensions.

THE MOON AND THE BAROMETER.—The influence of the moon on the barometer is dealt with by Mr. Bornstein in a recent article in the *Meteorologische Zeitschrift*. He refers to the question as to whether there exists any relation between the pressure of the atmosphere and the altitude of the moon. This study is based upon observations made at four different stations in Germany and Austria, and does not take into account the phases of the moon, or her distance from the earth, but considers merely the lunar day. The results obtained are: 1st, that the variations of pressure do not indicate any atmospheric tides, and 2d, that at three of the stations the pressure shows but one oscillation during the lunar day. At Berlin and at Hamburg the maximum takes place a little before the moon sets, and at Vienna, at the moment of least culmination, whereas the minimum takes place, at all the stations, at the moment of the moon's rising.

PHOTOGRAPHING RIFLE BULLETS.—An interesting deduction drawn from Prof. Boy's successful experiments on the photography of rifle bullets in motion is that the blurring of photographic images, due to atmospheric disturbance, can in many cases be wholly eliminated. The bullets, which were photographed quite sharply, had an appreciably greater velocity of motion than that (upon the average) of the molecules of air. Therefore, with equally short exposure in the case, let us say, of solar photography, the image-forming light is received through a virtually motionless, although, of course, not absolutely homogeneous, atmosphere.

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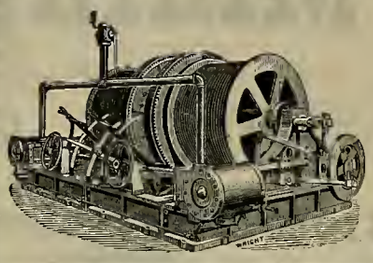
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ELECTRICITY.

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Every newly discovered force added to the list of potentials in the control of man has its usual introductory chapter of mistakes, accidents and alarms. This is one of the conditions of progress and differs only in degree between the experience of an apprentice or an inventor. In the matter of electricity, the old story has been retold, perfection was not instantaneous, and intelligence had to develop with experience. The installation of electric plants for lighting purposes on a commercial scale developed unsuspected and unknown phenomena. The electric spark in its transit made incendiary exits from its conducting lines, making extra work for firemen and more cinders and charcoal than the law allowed. This for a time was a cause of alarm, and added a new terror to the mysterious and invisible potentialities of electricity. It was, however, but temporary and conditional. Ten years ago the science of electric manipulation was raw, indefinite and crude. Invention was not out of its long clothes. Apparatus was cumbersome, and the trained assistant in the handling of apparatus was as yet in an embryonic condition Mechanics were apprentices, supplies were inadequate, and the special steam engine for operating dynamos had been neither planned nor built. These facts in consideration, the frequency of fire due to electric causes can be readily understood. They were simply incidents in the process of what in its early stages of application was largely experimental. The result was a stimulus to investigation and the application of precautions hitherto undevised, for a very excusable ignorance of their necessity. The fire scare, if unavoidable, was beneficial, and evolved the fact that fires due to electricity were preventable by ordinary practical means, and in no sense necessarily inherent in the use of electricity. The fire hazards to day are not those of ten years ago, and electric illumination is now less hazardous than any other artificial method of lighting. It cannot, of course, command perfect service; it has its careless and slip-shod manipulators, and cannot escape the usual percentage of fools, who, with an electric wire as with a mule or a gun, are always found at the wrong end.

Electricity is here to stay. It was not born in a suit of clothes or with six feet of longitude. It has had to grow to its present stature, and is not a matured adult. In the service of gas and steam and every other applied agent or force, the opening chapter was biographical of blunders, mistakes and temporary panics, till the discovery of danger made its avoidance or control a necessity. There are inherent dangers in kerosene, gunpowder and a wet pair of socks, but we annul the hazards by avoiding the causes. The intelligent management of any force develops with its use, and electricity is not left off the list of availability and security. It is the condition of all progress that the need of rare is in ratio with service rendered.—Age of Steel.

WATERSPOUTS.—Peltier observed that waterspouts were generally accompanied by electrical conditions. Might there not be, like cooditions attending the formation of these terrible tornados that are continually doing so much damage in the West? They are practically the same. On water, moisture and spray are the revolving material, while on land it is hut whirling air. This rapid whirling mist produces considerable friction as it rushes through the atmosphere; hence it seems that electricity must be generated. If this he really so, then Franklin's electric chimes ought to serve as a practical indicator of their approach, thus enabling the inhabitants to seek their prepared places of shelter with plenty of time to spare to save whatever valuables they choose. Or supposing that they are due to an electrical condition of the atmosphere, then might not several high towers be erected somewhere in the neighborhood of the city to draw from the clouds whatever charge there may be in them, thus abstracting the initial charge which may, as in the Holtz machine, he absolutely necessary to the formation of one greater and more intense?—Electrical Review.

UNEQUAL WEARING OF ELECTRIC LIGHT CARBONS.—In an electric arc the positive pole is hotter than the negative, the positive showing a temperature of about 4000° C., the oegative showing a temperature of 3000° to 3500° C. This difference of temperature produces a counter electromotive force which acts like ohmic resistance. The cause of the positive pole wearing away twice as fast as the negative is due to this difference in temperature.

USEFUL INFORMATION.

The Efficient Left Hand.

Left-handers are notably of more than the average strength and much more than the average accuracy of the eye. Leonardo da Vinci and Hans Holbein were left-handed. Left-handed batsmen are noted for hitting, left-handed fielders for smartness, and left-handed bowlers are generally fast. We know a gentleman, not a straight bat, whose back play is a perpetual source of astonishment to the spectators. But now comes in a factor of unknown quantity. One would think that where conventional usage has obtained from the left-handed one particular set of motions for the right hand, it would he one requiring but average skill. But is this so? The three arts of cricket are distributed among left-handed people in the most arbitrary and apparently inconsistent manner; most of them hat left-handed, but many bowl with the right, and some hat with the right and bowl with the left. No doubt it would be found that, on the whole, those actions requiring the utmost nicety and the greatest accord between eye and limb are allotted to the superior hand; again, spontaneous gestures and unstudied actions would also he performed by the same hand.

It is a remarkable fact that with the majority of people the neglected left hand is not in mere strength inferior to the right. We have heard truly right-handed people actually declare that their left hand is the stronger, and from the present writer's own experience he knows this to he the case. This may be from the mechanical advantage and better balance of the body, the right side being heavier, or it may be due to the large muscles of the unused arm being less hampered by the development of other muscles. It is difficult in these cases to say which is the "right" hand, for the fact that the unused arm is the stronger does not imply ambidexterity, nor can we justly give the precedence to strength over dexterity.—Boston Transcript.

HOW SPECTACLE LENSES ARE MADE.—In the manufacture of spectacle lenses, says the *American Manufacturer*, the bit of glass to be formed into a lens is fastened by means of pitch to a small block of hard rubber, so that it may be held. It is ground by being pressed against a rapidly revolving cast-iron disc on a vertical spindle, and with curvature equal and opposite to that desired in the lens. This is the "rough tool," and is kept moistened with emery and water. Several grades of emery are used in succession, changing from coarse to fine as the grinding proceeds. The glass is then transferred to the "fine tool," made of brass, and compared from time to time to a standard curve to insure accuracy. In this second grinding the abrading material is rouge. Finally, the lens is polished by being pressed against a piece of cloth powdered with rouge and fastened to a rotating tool. The glass is now loosened from its block, turned over, and the reverse side of the lens ground. When this has been accomplished, the lens is placed on a leather cushion, and held firmly in position by a rubber-tipped arm, while a diamond glasscutter passing round an oval guide traces a similar oval on the glass below. The superfluous glass is removed by steel pincers and the rough edges are ground smooth on scotch wheels.

ALLOYS FOR BORING TOOLS.—Some new alloys for the manufacture of boring and cutting tools are announced in the Sheffield (Eng), papers, and which are said to posess a hardness equal to that of tempered steel, with the advantage of not losing their hardness when heated hy friction. In making these alloys, pig iron, ferro-manganese, chromium and tungsten are melted together in graphite crucibles under stick charcoal and calcined borax, the tungsten and pig iron beiog preferably melted in clay crucibles together with the bar iron—the nickel, copper and aluminum being subsequently added. The metal is this time covered with stick charcoal only, and the alloys are cast in sand molds. For nail cutting blades, cutting blades for machines, cutting-out tools, and the like, the alloy consists of a combination of pig iron, Swedish bar iron, ferro-manganese, chromium, tungsten, aluminum, nickel and copper.

AN iron trolley pole, says the *Electrical World*, is no more dangerous from an electrical shock than one of cedar when the former is set into the earth so as to form a good "ground" connection. It is then at the same potential as the earth, and a current flowing through it is perfectly harmless.

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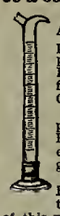
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MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

ZEILE.—Amador *Ledger*, Aug. 13: It is reported that repairs to the shaft of this mine will be undertaken next month. The air shaft, which caved a few weeks ago, has not been put in shape since. They simply made an opening through the debris so as to restore ventilation It is likely that this shaft also will be thoroughly repaired with the main shaft. The work will take two or three months to complete, and during this time most of the miners will be laid off The sulphurets have accumulated, so that the supply now on hand is sufficient to run the works for about two months. As most of the gold is obtained from the sulphurets, the net yield of the mine will not be interfered with to any extent during the suspension of underground work.

BAY STATE.—The Bay State continues to look well. They have a four-foot vein of fine ribbon rock in the north drift and a three-foot ledge in the south. The ore is undoubtedly of a paying character. The presence of a considerable flow of water is thought to be an indication that the main ore-body has not been found yet, and a crosscut is being run with the object of cutting it. Altogether, the prospects for a solid mine continue to be good. The stock has stiffened, and none can be had without a considerable advance on cost price.

SOUTH EUREKA.—At this claim the prospects are decidedly improving. The vein has widened out to six feet, and its quality has also improved. The ore is estimated to yield $4 per ton by mill process. This is still a very low-grade proposition, and one which, as the maximum grade of rock, would hardly justify the erection of mining and milling plant. But the increasing size and gold-bearing quality of the quartz justifies the hope that better things are yet in store.

FAVORABLE OUTLOOK. — Amador *Dispatch*, Aug. 13: Messrs. W. W. Scott and Wm. Sturneman, proprietors of the Pinevetta mine, near the old Ledford ranch were in town last week. They are highly elated at the favorable outlook of their mine, as they have recently struck a well-defined ledge of very rich rock. The ledge, so far is from 12 to 24 inches in width, but shows indications of widening as they go down. They estimate that they have at least $10,000 worth of ore in sight already, and it is not yet known how much more ore is yet uncovered.

THE LEDGE AT THE SOUTH EUREKA.—Amador *Record*, Aug. 11: The *Record* is able to chronicle still more cheering facts this week regarding the South Eureka mine. The north drift was in 75 feet on Tuesday and the ledge has widened out to 12 feet. The last assay made gave the ore a value of $5.30 to $6.20 a ton, and its quality is still improving. Operations will be prosecuted and the mine opened up with all the vigor that faith, backed by capital, can inspire, and should these encouraging developments continue—there is no doubt now that they will—we may expect to see things "booming" at the South Eureka, and a consequent revival in Sutter Creek of the times that once distinguished this place as one of the most flourishing mining camps in the State. It is characteristic of all the great bullion-producing mines on the mother lode to be the poorest at the 500-foot level. It will be understood that the present depth of the South Eureka is virtually on a level with the surface where the famous Eureka shaft was sunk, and it was at a depth of 500 feet where the first great strike was made in this latter mine.

THE BELMONT.—At this mine a sinking of 130 feet in the Boss shaft has been completed. A station is being opened on the 200-foot level preparatory to cross-cutting and drifting on the vein. We expect to soon be able to chronicle very important developments from that work. One of Knight & Co.'s No. 4 blowers is being placed in the mine. It will be run by a six-inch wheel and will supply the lower levels with an abundance of fresh air.

Butte.

BLUE LEAD NEAR OROVILLE.—*Register*, Aug. 11: Some years ago a deep shaft was sunk on the bluff near the depot and a blue cement some 70 or 80 feet in depth was passed through. Below this, river sand was reached, and it was thought the shaft was nearly down to bedrock, but the volume of water that rushed in was so great that it was impossible to keep it down, and the shaft filled up within 40 feet of the top. Those who worked in the shaft think that this deep bed of blue cement is a part of the great river channel found near Bangor and Wyandotte, which is turning out such rich pay. It is known that this blue lead stretches this way from Bangor past Wyandotte and Garden ranch, and experienced miners firmly believe that the same valuable channel of rich gravel exists in this vicinity. The shaft spoken of was struck at a depth of 60 feet. There was no trouble from water till the men reached the lower part of the blue cement, but the moment that was passed, the water rushed in rapidly. Those with whom we have talked about this matter think that if the bedrock beneath this gravel could once be reached, that it would be found enormously rich. John Toland, Mike Lout and Sam and Henry Downing are all familiar with the old shaft, as they helped sink it.

Humboldt.

THE GARBERVILLE OIL WELL.—*Western Watchman*, Aug. 13: Superintendent Gilfillan of the East Branch oil well, near Garberville, was in Monday for the purpose of getting dynamite with which to knock obstructions out of the way of the drill. In going down through the soft sand rock they struck a hard boulder, imbedded in the softer formation. If the drill had struck it fairly they could have pounded their way through it, but they struck it on the side, causing the drill to glance off, the tendency of which is to make a crooked hore and thus bind the drill. Mr. Gilfillan proposes to send down a charge of dynamite and blow the hard-headed accidental intruder to smithereens. As the joint reached is in oil-bearing rock, it would not be at all surprising if that charge should start an active flow of oil.

Nevada.

WYOMING MINE. — Grass Valley *Telegraph*, Aug. 13: The Wyoming quartz mine is situated on the east side of Wolf creek in Boston ravine and is being worked by a company, with Benjamin Reynolds as principal. Yesterday afternoon a ledge two feet in thickness was found at a depth of 35 feet in the mine, and it is filled with sulphurets and galena, and free gold can be seen on many places in the rock. The prospect is very encouraging.

THE DELHI.—Nevada City *Herald*, Aug. 11: At the Delhi, last week, some specimen ore was taken out which was about half gold. In sinking ten feet some 20 tons of ore were extracted. Robert McMurray states, however, that the mine is petering out, and that he is seriously thinking of shutting down. The ore is about gone in the present pay shoot, and to sink farther will require machinery costing $25,000, an outlay which the company does not feel justified in making. It seems too bad that this famous mine is worked out. It has been a great producer.

OMAHA MINE.—Grass Valley *Telegraph*, Aug. 11: Mr. George Mainhart informs us that he is firmly convinced that the Omaha mine will be its old self again in a few weeks at the farthest. The indications now are favorable indeed, and Mr. Mainhart is fully confident that he will soon reach what he has been seeking and running for. Several days ago eight or ten men were laid off from the mine on account of there being no room for them to work, but it is fully expected that all of those men will be put back, with also an additional force.

RICH ROCK —There was quite a crowd gathered around the store of Wm. Treolar this morning to see the rock brought up from the Cabbage Patch mine. Richard Vincent brought up the ore, and it came from the depth of about 40 feet, the ledge being about one foot in thickness. The ore was filled with free gold and gold-bearing sulphurets. The mine is owned by Grass Valley parties.

Placer.

DOING WELL.—Placer *Herald*, Aug. 13: The mines on the Forest Hill divide are doing well, and the prospects indicate for that section a more than usually good season. At Iowa Hill and Damascus the mines are holding their own, and those places continue to turn out a good deal of money. There are some drift-mining developments at Dutch Flat that indicate better times for that locality. The quartz mines of Auburn and Ophir are doing some work, though they are not as active as we would like to see them.

Plumas.

SPANISH RANCH.—Cor. Plumas *National Bulletin*, Aug. 13: The mining industry in this section is going rather slow at present. The water season being over, only the drift and quartz mines are active. The Murdock Bros. and Ericson & Co., are working their mines steadily, with the usual good results. These gentlemen possess good mines, and if allowed to work them by the hydraulic process, would realize large fortunes in a short time. The Shenandoah Co. has a large force of men at work constructing a new ditch, taking out quartz and doing development work, the results of which are said to be flattering.

San Benito.

THE GYPSY MINES —Hollister *Advance*, Aug. 11: A syndicate of capitalists of San Jose and San Francisco have combined to develop the Gypsy quicksilver-mining property. A large force of men is to be put to work at once, building furnaces, sinking shafts and running tunnels. Brick will be burned at the mine, under the supervision of Mr. J. Dorn, of Hollister. About 500 tons of material will require transportation from Hollister to the scene of operations, and this will afford employment to an army of teamsters. The development of this property will add greatly to the trade and prosperity of Hollister.

San Bernardino.

MORONGO DISTRICT. — Redlands *Citrograph*, Aug. 13: The Morongo district is coming up at a rapid rate as a good mining section. Late strikes in the Rose and other locations promise well. An onyx mine is being worked in a small way, and the output of gold and silver will be notably large in a couple of years. The most comfortable way to reach the district is through Bear valley.

GOLD.—Riverside *Phœnix*, Aug. 11: A brick made of gold worth $1105 was brought home by Messrs. Twogood & Herrick from the Rose mine, in which they are interested, a few days since. The mine is located in the Morongo district, and great things are expected in this section.

Siskiyou.

DAMS.—Siskiyou *Telegram*, Aug. 13: There has been considerable talk and worry among the miners on the Klamath river in regard to the dams across the river put there for the purpose of stopping the flow of water, allowing it to collect in vast bodies, and then, by lifting the gates, float their logs down the river to their mill, which is located at Pokegama. This the miners object to, as when the gates to the dam are shut down, the water in the river falls about 20 inches, which stops all their water wheels, which they use for pumping the water off the bedrock, and stops the work of their mines completely, while on the other hand, when they lift the gates and allow the water to rush down the river in vast torrents, it floods the mines, sweeps before it all the water wheels, sluice boxes, tools and in fact all the machinery. Florian LeMay, who has charge of the Phil Mott mine, on the river, was over last week and had an interview with the millmen at Pokegama, endeavoring in some way to come to an understanding on this important question, and it is hoped that it will be amicably arranged.

SALE.—A very important sale of mining property has just been negotiated at Sawyer's Bar. Mr. Stent, a practical miner and prospector, located several quartz mines in that district, and has just disposed of one of them at a figure with four ciphers in it. The purchaser is the Gladstone Mining Co. of Shasta county, with a mint of money behind it, and the property will be developed and worked on a scale that will boom the Sawyer's Bar district. We congratulate Sawyer's Bar at having such a company become interested in that locality, and we predict that they are only the forerunners of other companies that will seek investments and open up the quartz mines, over the divide. Mr. Stent, although a very modest and unassuming young man, is nevertheless quite a "rustler," and well deserves his good fortune.

NEVADA.

Washoe District.

CON. CAL & VA. MINE.—Virginia *Chronicle*, Aug. 13: 1500 level—From the south drift at point of connection with the old stopes we continue to extract some ore and fillings of average milling value. From the upraise which was carried up from the end of the crosscut run west 36 feet in from the main south drift, 155 feet south from the shaft station, we have continued to work upward and to extract ore of fair quality. 1650 level—Continued to extract some ore from the drift run east from the winze No. 3 (down 73 feet) in working upward from that point; also some ore from the old stopes at the north end of the California ground. In working upward from the drift run north from the bottom of the winze sunk 28 feet in this last locality through the old timbers, have continued to extract a few tons of milling ore. 1800 level—Along the south end of the drift running south from the crosscut run east from the winze No. 1 sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. From the bottom of winze No. 2, down 45 feet, the west crosscut No. 2 has been advanced 19 feet; total length, 43 feet; in a quartz formation of very low assay value. There has been extracted from all parts of the mine during the week 991 20-2000 tons of ore which was shipped to the Morgan mill, the average value of which per car samples was $28.28 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $24.89 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $15,323.90. Bullion on hand in our assay office, assay value about $14,200.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, at a point 84 feet in from its mouth, the west crosscut has been advanced 16 feet; total length, 100 feet, continuing in a quartz formation showing clay separations and carrying a very low assay value.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, at a point 40 feet east from the winze, has been advanced 15 feet; total length, 224 feet; continuing in vein porphyry with some clay.

UNION CON —900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 23 feet; total length west from the joint shaft, 2300 feet. The face is in soft porphyry, with small stringers of quartz of low grade.

UTAH.—340 level—From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 35 feet; total length, 172 feet; continuing in porphyry, clay and quartz.

SIERRA NEVADA.—The east crosscut Kenosha tunnel, started 200 feet south of crosscut No. 1, has been advanced 36 feet; total length, 106 feet; face in porphyry. The joint Sierra Nevada and Union west drift, 900 level, has been advanced 23 feet during the week; total distance west of shaft, 2300 feet; face in soft porphyry with stringers of low-grade quartz.

ANDES.—East crosscut No. 1, north on 420 level, advanced 19 feet. Total length, 55 feet; formation, porphyry and quartz.

GOULD & CURRY.—200 level—During the past week we have extracted 77 cars of ore from the old stopes on the 200 and 400 levels, the average car sample of which is $23.79. We will start to ship this ore to the Occidental mill to-day. On the Sutro tunnel level the joint north drift with the Savage Company has been advanced 20 feet; total length, 497 feet; face in porphyry. We have also been easing timbers in the joint upraise.

BEST & BELCHER.—900 level—Have resumed work in the north drift started from east crosscut 100 feet from switch and extended the same a distance of 16 feet; total length, 70 feet; face in porphyry and stringers of quartz.

HALE & NORCROSS.—1800 level—During the week advanced the north drift 20 feet; total length, 90 feet; face in hard porphyry. The south drift on this level was advanced 15 feet; total length, 75 feet; face in hard porphyry. A portion of this drift was timbered during the week. These drifts are still being continued outside and east of the ledge.

CHOLLAR.—Are repairing the raise from the 550 to the 450 level. Have started a crosscut 160 feet south of the north line, 930 level, which is now out 13 feet; face in porphyry.

POTOSI.—Are running a drift south from Potosi winze, 48 feet below the 1000 level. At a point 120 feet east of Potosi winze, 1100 level, are running a drift north in five feet of quartz that assays $15. Are drifting south from east crosscut 40 feet north of Potosi winze 1500 level, in two feet of fair-grade quartz. Potosi winze is down 452 feet below the 1500 level; bottom in quartz and porphyry. The northwest drift from the 1800 station, Ward shaft, has a total length of 710 feet; face in porphyry. Have repaired 50 feet of the drift during the week. Extracted and sent to the mill during the past week 368 100 2000 tons of ore from the 930, 1100, 1150 and 1300 levels. Milled during the week, 400 tons.

BULLION —Have started an upraise from east crosscut 320 feet south of north line, 1300 level; top is in quartz and porphyry. The joint Potosi winze is down 452 feet below the 1500 level; bottom in low-grade quartz and porphyry. The northwest drift from the 1800 station of Ward shaft has a total length of 710 feet; face in porphyry. Have repaired 50 feet of this drift during the week.

WARD COMBINATION SHAFT.—The joint Alpha and Exchequer south drift from the north line of Exchequer, 1800 level of Ward shaft, has a total length of 370 feet; face in porphyry. The joint Bullion and Potosi northwest drift from the 1800 station has a total length of 710 feet; face in porphyry. Have repaired 50 feet of this drift during the week.

ALPHA.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 370 feet; face in porphyry.

EXCHEQUER.—The joint Exchequer and Alpha south drift from north line of the Exchequer, 1800 level of Ward shaft, has a total length of 370 feet; face in porphyry.

SILVER HILL —Are repairing and changing the grade of the northwest drift, 200 level.

IDAHO.

THE DIXIE DIGGINGS.—Elmore *Bulletin*, Aug. 11: Perry Sprowl came in from his south Boise ranch Thursday and reports considerable activity in the Dixie mining district, about 25 miles from Mountain Home. A large number of prospectors are in that section and new and valuable gold ledges are being daily discovered. Wilson & Co. have a shaft down on their claim to the depth of 60 odd feet, and the ore, all the way, is remarkably rich in gold. The ledge is only about two feet in width, but from numerous assays it averages 58 ounces in gold to the ton. Sallisbury, the stage man, owns a claim near the Wilson, the ledge of which is three feet in width and a working test of the rock returned $100 per ton in gold. The rock is considerably decomposed and when water was plenty near-by, during a rainy day, the Wilson boys ran a lot of this soft ore through a sluice and cleaned up $70 of the shining stuff. Mr. Sprowl says that 40 or 50 new locations have been made in that section recently and that they are all very promising.

AROUND QUARTZBURG.—Cor. *Idaho World*, Aug. 2: I wish you would allow me space in your most valuable paper for a few items from our burg and the famous Gold Hill belt of quartz mines which has been the feeder of all the rich placer mines in this section of the rich Boise basin. This rich belt of quartz extends from Canyon creek, southwest of Boise basin, to Grimes Pass on Grimes creek, on the northeast of the basin. The creeks and gulches of this section, which have produced hundreds of thousands of dollars, have cut through this rich belt of quartz. I have traveled over this gold belt for 25 miles in length and found it from three-quarters to one mile in width. I was surprised to find such a large number of mines located on this belt. I will give the names of those I saw on my travels. On Granite creek and its tributaries are located the following: Gold Hill Co.'s mines, including the Gold Hill, Pioneer, Confederate, Dunlap and Lone Star. This company's mill has been running successfully for 25 years. It is a common remark in Quartzburg that the Gold Hill mill and county tax collector are always on the move. The Eisler, Iowa and Yellow Jacket lodes, owned by D. E Coughanour, and Tincher lode, owned by John Dickinson, are near the Gold Hill. On the West Fork of Granite creek are located the Newburg and Alice, owned by Mr. Sheridan; May Flower, Homeward Bound and Homestake, owned by Crossin, Williams & Co. The last mentioned five mines are under bond for a very large sum to Wm Sweet, who is employed by a Boston company. On Canyon and Fall creeks and tributaries are located the Homestake, owned by John Hanlen; Ebeoezer, owned by Gorman, Cougban ur & Co.; Belshazzar, Centennial and Bell Flower, owned by Geo. Tew & Co.; Mountain Chief, owned by Knight & Co.; Idaho mine, owned by Mullen, Carroll & Co. A large amount of ore has been extracted from several of these mines on Canyon and Fall creeks, and has paid very well. On California gulch is located the Carroll Brothers' group of mines—Ivanhoe, New Tipperary, Monarch and Clifton—which a Colorado company lately purchased; Yellow Jacket, Extension, Capital and Kennebec, owned by Driscoll & Bell; Mt. Etna, owned by K. P. Plowman; Mountain Lion, by Lamberton & Newby; the Blue Bird, by Carroll Bros; the Jersey Blue, by Mullen & Carroll. The Smith, Barber & Gardner lodes are located on this lode, and several others which I will mention some other time. All the mines mentioned carry a large percentage of iron sulphurets. When the MacArthur-Forrest cyanide process is put in operation for the working of the sulphurets of this belt, times will be good in this section. One cyanide plant has been built on Granite creek and another is in course of construction below Placerville, at the junction of

Granite and Wolf creeks. The Gold Hill mill continues to run regularly day and night on good ore from the Pioneer mine. D. E. Coughanour, the enterprising mining man of our town, has a crew of men at work in a tunnel to tap the Iowa and Eisler leads, about 500 feet deep. Quartzburg is the only town located on this great Gold Hill belt, and every man is working.

THE CHAMPLAIN GROUP OF MINES.—Wood River *Times*, Aug. 6: A half interest in the Champlain group of mines has just been sold for a consideration of $20,000. The transaction was consummated on the 20th of July. Chicago parties were the purchasers. This promising property is situated on the Gold Belt, about three miles from the Camas No. 2. It was owned by L. C. Bailey, and had not been worked for some time prior to the resumption of operations this spring. Since that time it has continued to develop well, and is now showing up satisfactorily. In this connection we cannot refrain from saying if ample capital were invested in the mining industry in this region to secure thorough development of mines, the returns would undouhtedly justify the outlay.

OREGON.

NICKEL.—Jacksonville *Times*, Aug. 11: Judge Crawford of Medford was at Elk creek lately to examine a large deposit of ore, claimed to be nickel. He reports large croppings of that ore. Samples have been sent away for assay. If the per centage of nickel in the ore is sufficiently large, the mine may prove very valuable.

NEW MILL.—The company which purchased the Anderson gold quartz mine in Wagner creek seems greatly encouraged by the outlook. The superintendent. Mr. Wilson, reports that the developments down to 250 feet show a continuous body of sulphuret ore of almost regular width. The company received its machinery from the new mill at Ashland last week. It is proposed to erect the machinery at the old planing mill site in Ashland, and to utilize that power. The mill and concentrator are erected under a special contract with the inventor, who guarantees a success. The mill crushes the ore, not with stamps, but with rolls, and the crushed ore does not pass over plates, but into the concentrator. The concentration of the copper and iron pyrites in the ore will be accomplished by fans and air currents, blowing the "gangue" away like chaff. The concentrates will be shipped to smelters. A capacity of 70 tons a day is claimed.

THE ORME MINE.—Rogue River *Courier*, Aug. 13: The ledge being developed by the company composed of Messrs. Boynton, McFerson and Orme, promises to make its owners rich in the near future. This ledge adjoins the famous Jewett mine about four miles from town on Old Baldy. It was a blind ledge and was discovered with a pick and pan. The lowest assay fignres $61.15 to the ton, and the highest reaches $400. The spur of the ledge is 20 inches wide between well-defined walls, but the main ledge is much wider. A shaft is being sunk and the men are down 20 feet. The ledge is widening and the rock getting richer as the sinking proceeds.

SOUTH DAKOTA.

THE MINING OUTLOOK.—Deadwood *Pioneer*, Aug. 11: Never before in the history of the Black Hills has the mining outlook been so bright. Eastern investors and speculators have had their attention called to the unparalleled opportnnities offered for investment, and a large amount of money is being daily put into the mining industries of the country. The recent pnrchases of Eastern parties of some of the most promising mining interests in Bald mountain means the speedy erection of large reduction works to treat the vast hodies of ore, which will in all probability he located in Deadwood. All the plants so far erected are running with much success, and each day adds to the output. The Homestake group continues its steady production, and reports from the Caledonia, based on the statements of those who are supposed to know, indicate that it is paying better now than it has ever done. Recent discoveries on the lower levels of rich ore hodies have materially added to the value of the property, and will soon place it among the dividend-payers. In the southern Hills, development work on the Keystone has shown it to he of immense value, and St. Paul parties who recently purchased it, have enough faith in its richness to erect a 120-stamp mill to work the ore. The J. R., in the same direction, is now on a paying basis, and the Spokane, Calihoga and many others are only awaiting railroad facilities to hegin work on a large scale. The Harney Peak Tin Co. will start its mill sometime in November and hegin the production of American tin. In the western Hills the Inter Ocean continues to show up well as the development progresses. In two months the mill will he running. It will he fitted up with concentratora and all improvements necessary to save the precious metals. A great deal of prospecting is heing done in this section, and everything points to a series of hrilliant strikes.

WASHINGTON.

THE TRIUNE MILL.—Okanogan *Outlook*, Aug. 11: Sharpneck & Dexter returned last week from Chicago, hringing the welcome news that the machinery for the Triune mill has heen pnrchased and was on the way in. It is to he a ten-stamp mill at first, hnt will he built and furnished with a capacity and power to operate 20 st mps. A 50-horsepower Corliss engine will furnish motive power for running the mill and two steel cars, of a capacity of 2000 pounds each, will he used in transporting the ore to the mill, which is to he located withiu a few yards of the ore hody. Sharpneck & Dexter have entered into a contract to put in the mill for a third interest in the mine, and have already put a force of men at work grading the site and getting material on the ground for the huilding.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 18, 1892.

There was a marked increase in the volume of goods sent out the past week, with the shipments to upcoast ports showing, if anything, the largest gain. The spirit of conservatism still dominates, for seldom can the best traveling salesman induce interior merchants to huy mucb beyond near-by wants. Remittances are slow, but then there is no scarcity of funds; and althougb large sums of money are being called for with which to make advances on grain, yet conservative bankers do not look for any friction in the money market. The large engaged tonnage in port for wheat-loading will give a good supply of hills on Europe, while the large disengaged tonnage assures of the supply heing continued for the next 90 days. Possibly the only unfavorable outlook at present is that the price of wheat may go to such lnw figures that for self-protection farmers may combine to hold back supplies, in which event ships will experience considerable difficulty in getting cargoes. Our advices from the agricultural districts report fruit-harvesting still under full-headway, with the larger proportion of the crop contracted early in the season. The high markets for California green fruit at the East are causing more to be shipped green than ever before. Tbe shipments are creating a scarcity, in some localities, of refrigerator cars. Advices from the various gold-mining districts are of a most promising character. They indicate more active and prosperous times. There is a quiet but rather persistent inquiry for good mines which are either developed or in the course of development. Eastern mail advices report business in several branches suff ring by reason of labor strikes. Of necessity, with labor discontented, all industrial branches are unfavorably influenced. The leading financial centers report money easy and that the requirements for crop purposes will fall considerably below the wants in last year. The falling off, it is claimed, will he due to lower prices and shorter crops. Short crops are reported in all kinds of grain, fruit and potatoes, while the cotton outturn will be considerably below that in 1891, and a short cotton crop cuts a very important figure. The International Monetary Conference is receiving more than usual attention at home and abroad. This, no dnubt, is largely due to depressed trade the world over, and a general desire of discovering some means by which the various industries can be galvanized into life and more general prosperity follow. While the prevailing opinion, and we might say the only opinion expressed, is that the conference will not do anything to remonetize silver, yet, under broad discussions on the financial situation, much light will be thrown on the silver problem which will lead to educating the masses, so that silver in all its bearings on the trade and commerce of the world will be better understood and bear fruit within the next few years. This opinion is well-voiced by the expressed views of Comptroller of the Currency Hepburn who says: "Whether tbe proposed silver conference shall produce immediate results or not, it cannot fail to be of great advantage to this country." "The capacity of Europe," he said, "to misunderstand America and things American is proverbial. The sending abroad nf so strong a body of men as the Commission named by President Harrison must result in educating Europe to the exact condition of our monetary affairs and resources and the trend of public sentiment bere. That there is not gold enough to furnish currency for the whole world is generally admitted. That silver with some proper ratio, or in some degree, must be utilized, is also generally admitted, and an International Conference like this will serve to concentrate all eyes on their discussion, and the result of their deliberations will reach all ears. The conference must be of great benefit as an educator, even if no immediate results follow."

SILVER—On Friday and Saturday the lowest recorded quotations came through from Londnn and New York. On Monday there was a slight recovery, said to be due to the shorts filling. Our New York exchanges are confident that the market will sell down to 80 cents in New York before there is much of an upmove. If silver is, as we confidently believe, under strong manipulation, the bears may be disappointed and much higher figures be reached before the lowest points are toucbed. Markets under manipulation usually work by the rule of contrary. The International Monetary Conference will probably be held in Brussels in the month of October. There was exported to Japan, the past week, $46,000 of hullion.

MEXICAN DOLLARS—Exports the past week aggregate as follows: China, $227,587; Japan, $108,150; total, $335,737. The market ranges from 66¼ to 67¼ cts.

QUICKSILVER—Receipts the past week aggregate 418 flasks. The market is irregular with buyers reporting concessions.

BORAX—Receipts tbe past week aggregate 846 centals, and exports by sea 1230 centals. The market is quiet but steady.

LIME—Receipts the past week aggregate 5124 bbls., of which 1275 bbls. came from up north. The consumption continues large, but the market is irregular with more or less cutting reported. Quotations furnished range from $1.25 to $1.50 per bbl.

PIG IRON—Imports the past week aggregate 302 tons from New York. The market continues to he reported in buyer's favor under free offerings of American. The lnw freights from New York are in favor of importers. Mail advices from New York report as follows: Pig iron is dull and weak in all markets, Pittsburg recording a further slight decline in the price of Bessemer pig. Monthly statistics how a sharp decline in current production, the total coming down to 155,000 gross tons per week. The South has thus far not participated in this restriction, a fact which explains its leadership in the decline and the weakness of the producers of that section.

TIN—Imports the past week aggregate 942 boxes plate from Liverpool and 214 pigs from San Diego. The market is inactive and barely steady. Fruit canners have taken a much larger quantity than had been estimated.

PIG LEAD—The market is essentially unchanged. The Eastern markets are dull and tame, with buyers not taking much interest in it.

COPPER—The market is dull and heavy. New York mail advices note a fairly steady market, with no selling pressure. In their private circular of August 2d, James Lewis & Son say: "The prospects of reduced supplies later on, due to the combined action now in force on the part of the chief producers of copper to restrict their production, has had little or no effect upon values so far, as it has been neutralized by the excessive production of the American companies prior to the 1st ult., and an increase in stocks here. As it is generally believed that the cost of producing copper by the Calumet and Hecla Company of Lake Superior is lower than that of any other copper-mining company, in the absence of any annual balance sheet we find that during the seven years, 1885 to 1891, an average dividend of $17.71 per share was declared on 100,000 shares, or a total of $1,771,000, and that during this period the average annual production of copper was 52,369,000 pounds, the average value in New York being 13.13 cents per pound. As the dividend represents 3.38 cents per pound, the cost of production (including expenditure on construction) would appear to be 9.75 cents per pound, equal to £46 5s. 0d. per ton, with 2½ per cent discount.

COAL—Imports the past week aggregate as follows: Coos Bay 800 tons, Liverpool 3589, Swansea 5951, Nanaimo 4935, Seattle 4720, Departure Bay 2252, Tacoma 2160, Total 24,407 tons. While the market is reported unchanged in quotations, yet there is an undertone of strength which indicates better prices later on. The consumption is not as large as had been expected, but it is claimed that after this month the demand will begin to increase. The higher freights from England and Australia are against importers.

Mining Share Market.

SAN FRANCISCO, Aug. 18, 1892.

Trading has been very light; even cross-orders were not played with the usual vim which characterizes the mill rings and stock pools. So far, Bob Morrow and his brokers have not been able to execute the reported order of D. O. Mills to send the market lower, but his usual cat-like actions appear to he pronounced lately, which lead the better-informed to the opinion that he is waiting a favorable opportunity to jump on the market and send prices down with a rush. Those who are said to be in a position to know claim that Mr. Morrow and his brokers may have to advance prices slightly before they are able to successfully execute the reported order of D. O. Mills. The mines warrant much higher prices than are now quoted, but experience has taught that with the mines managed by dummies, the mines are one thing and the share market quite another; or, in other words, it makes but little difference how large and rich is the ore uncovered in a mine—all that outside shareholders get under the present system are assessments, while the rings get the hullion. This one-sided conditinn of affairs is creating the opinion that the Mining Stock Association ought to stop civil suits and commence criminal proceedings (unless a bona fide reform movement is inaugurated by the rings) against those that members of the association claim have been guilty of misappropriating funds. Such a course would bring about quicker and probably better results than the seemingly long-winded civil suits which allow the inside rings to continue looting the mines, while their dummies levy assessments to pay for the work and, at the same time, freeze out shareholders. The Brokers' Combine might also take a hand at the game. This reminds us that nothing has been heard lately about the Combine. There are several brokers in it who are known to he fighters, and who the insiders have good reason to fear. Why do they not come to the front? Now is a favorable time for cnncerted action. Perhaps they are waiting to see if such refnrmers (?) as Gen. R. Wells, Charley Hirshfeld, H. Zadig and a few others will not institute reforms of a beneficial character. It is the opinion of the many on the outside, that when those who have had close relations to the inside, work in the interest of outside shareholders, the time has arrived when the evil one will be chained and the millennium commenced.

Miners say that no work has been done in the Julia mine for a long time, yet the president of the company, it is said, draws a salary of $200 per month, while other seeming sinecures draw good salaries. It is claimed that the Julia is not the only Comstock company which pays good salaries to officers for doing nothing. C. Hirshfeld is vice-president of the company. Why does he not make reforms in this and other mines of which he is an officer or director?

George R. Wells and H. Zadig, the stockbroker, have not done such wonderful things with the Occidental mine. Those in position to know say the mine should pay dividends. The superintendent's reports ought to conform to the law under which the company incorporated.

Our New York exchanges are quite bullish on the situation, and predict an active hull campaign in mining shares before "snow flies." It is to be hoped that they are right, but as long as there is large profit in mine looting, so long will the public he denied everything except assessments.

It is now claimed that the three bars of stray hullion mentioned in last week's issue have been traced to the Hale & Norcross. If this is so, then in what a position it places Attorney-General W. H. H. Hart, who is a director in the company. Mr. Hart may yet find it dangerous sport to play with edged tools, particularly if the latter are furnished by millowners.

News from the Comstock mines is of a more favorable character than heretofore reported. Seeming y reliable authorities report that rich ore is being developed in Con. Virginia, Savage, Mexican, Potosi, Bullion, Challar and two of the Gold Hill mines. While reporting that the situation is better than ever before, they do not look for much of an improvement in the share market with the mines managed as they are at present. It is now stated that the mill ring's wicked partners (the ranchmen) in the water rights of the Carson will experience a change of heart soon, and let enough water flow down the Carson to run the mills. This favorable change of heart will probably take place when the ring's dummies have frozen out, through assessments, about every outside shareholder. From the outside mines our advices are uniformly favorable. The work now going on appears to be to kill time. In several of the mines rich ore has been developed.

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	15
BORAX.			
Refined, in car lots	—	@	7½
Powdered, do	—	@	7½
Concentrat'd, do	—	@	6½
All grades lobar at advance.			
COPPER.			
Bolt	22	@	—
Sheathing	22	@	—
Ingot, jobbing	—	@	14½
Do, wholesale	—	@	13½
Fire Box Sheets	22	@	24
IRON.			
Bar, base	—	@	3
Norway, base	—	@	4½

PIG IRON.	Spot.
Eglinton ₩ ton	22 00@—
Glengarnock	23 00@—
Am. Soft, No. 1	24 00@—
Oregon Pig	—@—
Puget Sound	—@—
Clay Lane White	24 00@—
Langloan	22 00@—
Tbornclitfe	23 00@—
Gartsherrie	22 00@—
Barrow	22 00@—
Cargofleet	22 00@—
CHROME IRON ORE.	
Per ton	10 00 @—
LEAD.	
Pig	— @ 4½
Bar	— @ 5½
Sheet	— @ 7
Pipe	— @ 6½
SHOT.	
Drop, sizes smaller than B, ₩ bag of 25 lbs	$1 85
Do do, B and larger sizes ₩ bag of 25 lbs	2 10
Buck. Balls and Chilled do, ₩ bag of 25 lbs	2 10
QUICKSILVER.	
Home trade, per flask	43 50 @44 00
For export	38 @

STEEL.			
English, lb	—	@	18
Canton tool	—	@	8½
Sl'k Diam'd tool	8½	@	16
Pick & Hammer	1½	@	10
Machinery	4	@	5
Toe Calk	—	@	4½
TINPLATE			
B. V. steel grade 14x20, spot	—	@	6 00
Charcoal, 14x20	—	@	5 00
Do roofing, 14x20	—	@	6 00
Da, do, 20x28	—	@	12 00
PIG TIN.			
Spot ₩ lb	—	@	24
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$8 00		
Gretta	6 75		
Nanaimo	7 00		
Gilman	6 00		
Seattle	6 50		
Coos Bay	5 50		
Cannel	8 50		
Egg hard	11 50		
Cumberland, in sacks	14 00		
Do, bulk	13 00		
Wallsend	7 00		
Scotch Splint	7 00		
Brymbo	6 75		
West Hartley	7 60		
TO LOAD—PER TON.			
Australian	5 75@—		
Liverpool Steam	6 00@—		
Scotch Splint	6 00@—		
Cardiff	6 25@—		
Lehigh Lump	12 00@—		
Cumberland	9 00@—		
Egg hard	10 00@—		
West Hartley	6 60@—		
COKE.			
English, to load	$8 00@ 9 00		
Do, spot, in bulk	—@10 00		
Do, in sacks	—@12 00		
Cumberland	9 00@—		

Eastern Metal Markets.

NEW YORK, Aug 17.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38¾	83	11 50	4 05	20 45
Friday	37¾	82½	11 50	4 10	20 45
Saturday	37⅝	82½	11 50	3 95	20 45
Monday	38¾	83¾	11 60	4 00	20 45
Tuesday	38 3-16	83½	11 50	4 00	20 40
Wednesday	38 3-16	83⅝	11 50	4 00	20 30

Quicksilver is barely steady. Borax is slow. Pig tin is irregular Copper is quiet but steady. Pig iron is firmer. with an increasing demand.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 27.		WEEK ENDING Aug. 3.		WEEK ENDING Aug 10.		WEEK ENDING Aug. 17.	
Alpha	.15	....	.10	.15	.15	.20	.15	....
Alta	.25	.30	.25	....	.30	....	.25	....
Andes	.35	....	.25	.30	.35	....	.30	.35
Belcher	.85	1.15	.85	.95	.90	.95	.80	.90
Belle Isle	....	....	....	....	....	....	.10	....
Best & Belcher	1.50	....	1.25	1.50	1.30	1.50	1.30	1.40
Bullion	.30	.35	.25	.35	.30	.35	.30	.25
Bodie Con	.30	.3	....	....	.30	....	.25	.30
Bulwer	.40	.45	.40	....	.40	....	.30	....
Commonwealth	....	....	....	....	....	....	.10	....
Con. Va. & Cal	3.50	3.65	3 20	3.30	3.20	3.50	3 20	3.45
Challenge	.30	.35	.25	.30	.35	....	.25	.30
Chollar	.45	.50	.50	....	.55	.65	.50	.50
Confidence	....	....	1.50	....	1.35	....	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Caledonia	.20	....	.10	.15	....	....	.15	....
Crown Point	.55	.75	.55	.60	.55	.60	.50	.60
Crocker	....	....	....	....	....	....	....	....
Del Monte	.05	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	1.50	1.60	....	....
Exchequer	.10	....	....	....	.05	.10	.05	....
Grand Prize	....	....	....	....	....	....	.05	....
Gould & Curry	1.00	....	.80	.90	.80	1.05	.85	.95
Hale & Norcross	1.10	1.20	.95	1.05	.85	1.05	.75	1.00
Julia	.10	....	.05	....	.10	....	.05	....
Justice	.05	....	.05	....	.05	....	.05	....
Kentuck	.05	....	.05	....	.05	....	.05	....
Lady Wash	....	....	.05	....	.10	....	....	....
Mono	.30	....	....	....	....	....	.15	....
Mexican	1.35	1.55	1.25	1.35	1.30	1.45	1.20	1.30
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	....	....	.05	....	....	....	....	....
New Queen	.20	.45	.20	....	.20	....	.20	....
Occidental	.30	....	.30	.35	.30	.45	.40	.45
Ophir	2.30	2.65	2.05	2 25	2.15	2.40	2.15	2.40
Overman	.30	.40	.25	.30	.25	.30	.25	.30
Potosi	.40	.50	.45	....	.50	.60	.45	.55
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	....	....
Savage	.85	1.10	.90	1.00	.90	.95	.65	.95
S. B. & M	.20	....	.16	....	.20	....	.20	....
Sierra Nevada	.85	1.06	.90	1.00	1.05	1.35	1.05	1.30
Silver Hill	.05	....	....	....	.05	....	....	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.70	.85	.70	.75	.80	1.05	.75	1.00
Utah	.20	.25	.20	.25	.20	.25	.20	.25
Yellow Jacket	.40	.65	.45	.65	.50	.60	.50	.55

*Assessment added.

Complimentary Samples.

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MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY
Best & Belcher M Co, Nevada	52	25c	Aug 17,	Sept 22, Oct 13	L Osborn 309 Montgomery
Bodie Cons M Co, California	14	25	June 20,	July 24, Aug 22	H D Walker, 3 8 Montgomery
Bullion M Co, Nevada	39	25c	Aug 11,	Sept 15, Oct 4	R R Grayson, 331 Pine
California Verde Antique Marble Co, Cal	2	1c	July 12,	Aug 23, Sept 12	W J Gurnett, 3 8 Pine
Confidence M Co, Nevada	21	50c	Aug 13,	Sept 15, Oct 6	A S Groth 114 California
Con New York M Co, Nevada	8	10c	June 28,	Aug 2, Aug 23	C E Elliott, 309 Montgomery
Crocker M Co, Arizona	12	5c	Aug 11,	Sept 20, Oct 18	A Waterman 3 9 Montgomery
D-l Monte M Co, Nevada	6	10c	July 23,	Sept 5, Oct 5	J W Pew, 310 Pine
Exchequer M Co, Nevada	33	1c	July 27,	Aug 31, Sept 20	C E Elliott, 309 Montgomery
Florida Hill M Co, Idaho	4	3c	July 29,	Sept 2, Sept 23	R R Grayson 331 Pine
Gold Mt M Co, California	3	$2	July 16	Aug 20, Sept 8	J F Curtis, 325 Montgomery
Golden Fleece Gravel M Co, California	17		July 16,	Aug 21, Sept 20	W J Gleason, Phelan Block
Gover M Co, California	3	10c	July 28,	Sept 1, Sept 23	R McF Doble, 15 Fremont
Gua aran & California M Co, Honduras	7	$1.50	Aug 8,	Sept 15, Oct 8	E Oliver, 72 Mint Avenue
Hale & Norcross M Co, Nevada	102	50c	Aug 11,	Sept 15, Oct 7	A B Thompson, 3 9 Montgomery
Independence M Co, Nevada	17	5c	Aug 15,	Sept 19, Oct 13	J W Pew 3 0 Pine
Justice M Co, Nevada	51	40c	July 26,	Aug 31, Sept 19	R Kelly, 419 California
Kentuck M Co, Nevada	4	10c	July 1	Aug 18, Sept 8	J W Pew, 310 Pine
Mountain Tunnel M Co, California	5	7c	July 18,	Aug 27, sept 26	E C Lander, 218 Sansome
Ophir M Co, Nevada	8	50c	June 3,	July 7, July 27	E B Holmes, 3 9 Montgomery
Peer M Co, Arizona	13	10c	July 19	Aug 25, Sept 23	A Waterman, 3 9 Montgomery
Peerless M Co, Arizona	18	5c	July 6,	Aug 11, Sept 7	A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	5c	July 11,	Aug 14, Sept 12	G R Spluney, 310 Pine
Silver Hill M Co, Nevada	31	5c	Aug 2,	Sept 6, Sept 27	D C Bates, 3 8 Montgomery
Silver King M Co, Arizona	8	25c	July 19,	Aug 27 Sept 27	J W Pew, 3 0 Pine
Union Co s M Co, Nevada	46	20c	July 18,	Aug 24, Sept 13	A W Barrows, 303 California
Western Star M Co, California	1	5c	July 25,	Aug 30, Sept 21	J A Reed, 328 Montgomery

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
El Leopoldo G & S M Co	Annual	Jahn z Howes, 130 Sansome	Aug 26
Julia Cons M Co, Nevada	Annual	J Stadfeld, 309 Montgomery	Aug 20

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osb rne, 3 8 Montgomery	April 28
Champion M Co, California	15	T Wetzell, 310 Pine	Aug 18
Con Cal & Virginia M Co, Nevada	50	A W Haven, 309 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bus , 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co, California	1 00	A H Clough, 230 Montgomery	Aug 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 26

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co, Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 9, 1892.

480,647.—QUARTZ CRUSHER—A. P. Anderson, Oriental, Nev.

480,542.—ELEVATOR—W. N. Anderson, San Rafael, Cal.

480,360.—COIN CHUTE—R. F. Avery, Spokane Falls, Wash.

480,649.—BOOK INDICATOR—Bailey & Welch, San Jose, Cal.

480,656.—TELEPHONE—J. A. Christy, S. F.

480,560.—TICKET PUNCH—A. W. Coffin, S. F.

480,569.—MEAT AND VEGETABLE CUTTER—W. R. Ellis, Woodland, Cal.

480,582.—MAILING ATTACHMENT FOR BOOKS, Etc.—C. S. Hardy, San Diego, Cal.

480,596.—EXTENSION SHOE LAST—J. H. Livermore, Port Townsend, Wash.

480,330.—KEY FASTENER—A. C. Mack, Portland, Or.

480 332.—STEAM POWER STAMP—C. A. Marlett, Portland, Or.

480 272.—IGNITER FOR GAS ENGINES—E. I. Nichols, S. F.

480,621.—OILER FOR HAND SAWS—S. Parmlee, Portland, Or.

480,625.—LEO-SPREADER FOR HORSES—J. R. Phelps, Sacramento, Cal.

480,353.—UMBRELLA RIB—W. L. Uhlenbart, Astoria, Oregon.

480 639.—VENDING MACHINE—W. Van Sant, Auburn, Cal.

480,644.—TELEGRAPH TRANSMITTER—C. Willoughby, S. F.

480 616.—LIFTING JACK—York & Austin, Clinton, Cal.

21,771.—DESIGN FOR DENTAL PUNCH—C. E. Blake Sr., S. F.

The following brief list by telegraph, for Aug. 16, will appear more complete on receipt of mail advices:

California—Hermann Baer, San Francisco, dress form; Byron Jennings, San Jose, railway railchair; Dwight Kemp, Summerfield, musical instrument; Joseph P. Magney, Oakland, sash balance; William H. Masser, Los Angeles surgical appliance; Hector McKinnon, Eureka, lumber elevator; George Merritt, San Francisco, electric train signal; Frederick W. Ruoff, San Francisco, fermenting process; Coleman Talbott, Santa Rosa, gate.

Washington—Melchi M. Grove, Garfield, pump; Charles T. Plumbtree, Spokane Falls, side reflector.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BOOK INDICATOR.—M. G. Bailey and H. T. Welch, San Jose, assignors to James G. Spaulding, S. F. No. 480,649 Dated Aug. 9, 1892. This invention relates to that class of indicatore or marks for hooks in which an indicating strip lies transversely upon and is moved vertically over the page of the hook to indicate the lines thereof. The invention consists of a a hookmark or line indicator of this class, in which the indicating strip is made of a thin, flexible or pliant sheet of celluloid. It also consists in a connection or bearing the full width of the indicating strip, whereby said strip is mounted and slides upon its support. The object of the invention ie to provide in this class of hook indicators an indicating strip of such a character that, by reason of its pliancy and flexibility, it will lie perfectly upon the page of the book; another object is to hold the indicating strip perfectly to the support upon which it is mounted, by means of such a connection as will enable it to slide up and down upon said support easily, without cramping or binding and with precision; and also to insure, by meaos of a stiffening-eleeve, the extension of the indicator strip from its support at a right angle under all circumstances.

LEO-SPREADER FOR HORSES.—James R. Phelps, Sacramento, Cal. No. 480,625. Dated Aug. 9, 1892. This invention relates to a device for gaiting horses, and it conoists of steel or other elastic arms attached to the shafts of the vehicle or attachments thereto, said springs having a journal attachment so that the lower ends are allowed to move in conjunction with the movement of the horse's legs with which they are connected, so as to produce an outward pull thereon. The essence of the invention is contained in the arms connected with the shafts and having an elastic outward pull which is communicated to the horse's legs by connecting rigid or elastic straps. The horse's legs are spread as desired and his gait improved.

COIN-ACTUATAN VENDING MACHINE.—Wm. S. Van Sant, Auburn, Placer Co. No. 480,639. Dated Aug. 9, 1892. This invention relates to that class of machines dependent for their operation on the deposit of a coin and adapted to supply small articles of merchandise. It is especially intended for furnishing sandwiches, pieces of pie, and other articles of food, from which the device may be properly termed "a lunch-vending machine." It consists in the novel construction and arrangement of the coin-actuating tripping mechanism for releasing the drawer wherein the articles are successively deposited, whereby one may be withdrawn.

TICKET PUNCH.—Arthur W. Coffin, S. F. No. 480,560. Dated Aug. 9, 1892. Thie invention is an improvement upon patent No. 440,830, dated Nov. 18, 1890, issued to the same inventor, and it consists in certain details of construction whereby the operation of the ticket punch is rendered more convenient, accurate and safe.

MEAT AND VEGETABLE CUTTER.—Wilson R. Ellis, Woodland, Yolo Co. No. 480,569. Dated Aug. 9, 1892. This is one of that class of cutters for meat and vegetables in which rotary cutters are made to travel eccentrically over the block. The object of the invention ie to provide a meat and vege able cutter in which the cutting blades or disks shall be caneed to travel over and act upon every portion of the material.

Mining Company Elections.

THE INDEPENDENCE MINING CO. has elected the following officers: George C. Hickox, president; F. A. Berlin, vice-president, and M. A. Jackson, T. J. Shackleford and J. W. Pew, directors. J. W. Pew was reelected secretary and R. M. Caller, superintendent.

BENTON CONSOLIDATED MINING CO. Directors—John T. Hill, V. B. Allan, E. M. Morgan, Edward Howard and E. Hestres. V. B. Allan, secretary of the company, reports a balance of $44,811.69 to the credit of the company.

LADY WASHINGTON MINING CO. Directors—Monroe Thompson, S. G. Whitney, R. N. Graves, J. E. Jacobus and W. B. Englisb.

WANTED.

A position by a Mining Engineer and Metallurgist. Lead and Copper Smelting. Address Box W., this office.

FOR A NOTARY PUBLIC go to Lee D. Craig, No. 316 Montgomery St., S. F.

Assessment Notices.

GOVER MINING COMPANY. LOCATION OF PRINcipal place of business, San Francisco, California; location of works, near Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 28th day of July, 1892, an assessment (No. 3) of Ten Cents (10c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Treasurer of the Company, at his office, Nos. 13 and 15 Fremont Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Thursday, the 1st day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 26th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

ROBERT McF. DOBLE, Secretary.

Office—Nos. 13 and 15 Fremont Street, San Francisco, California.

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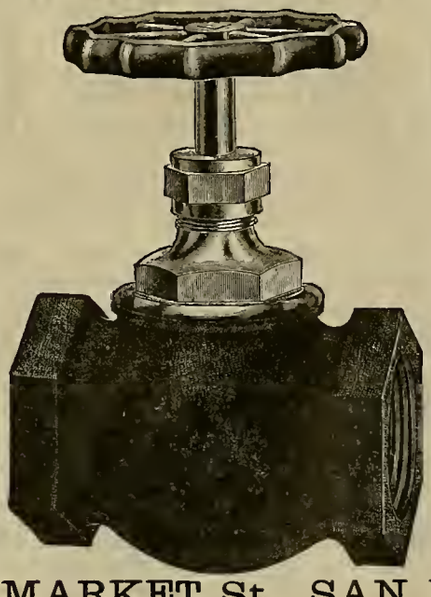

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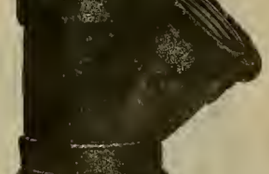

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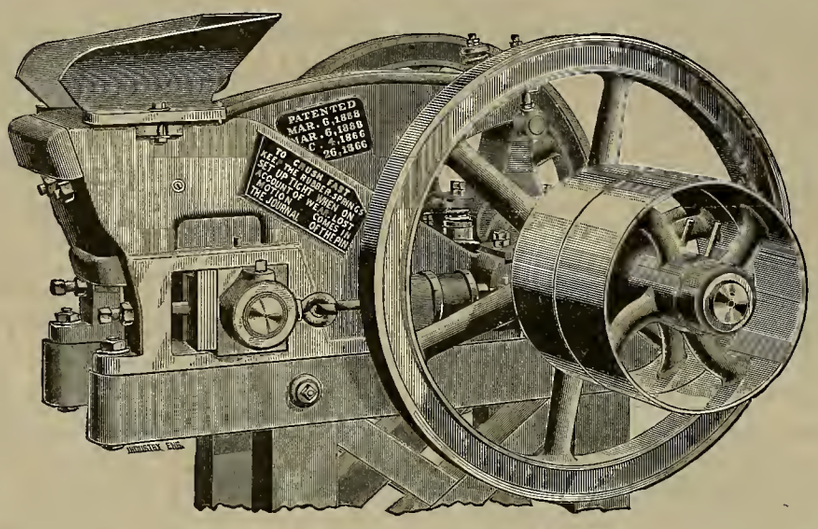

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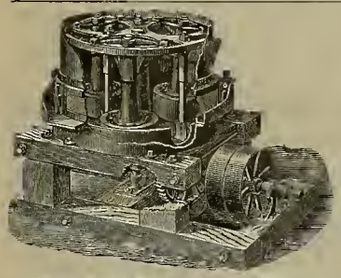

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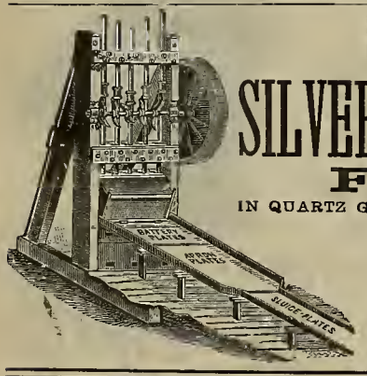

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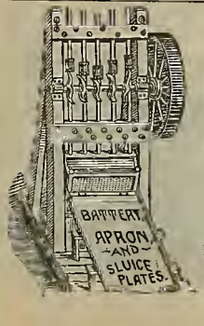

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VOL. LXV.—Number 9. DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, AUGUST 27, 1892.

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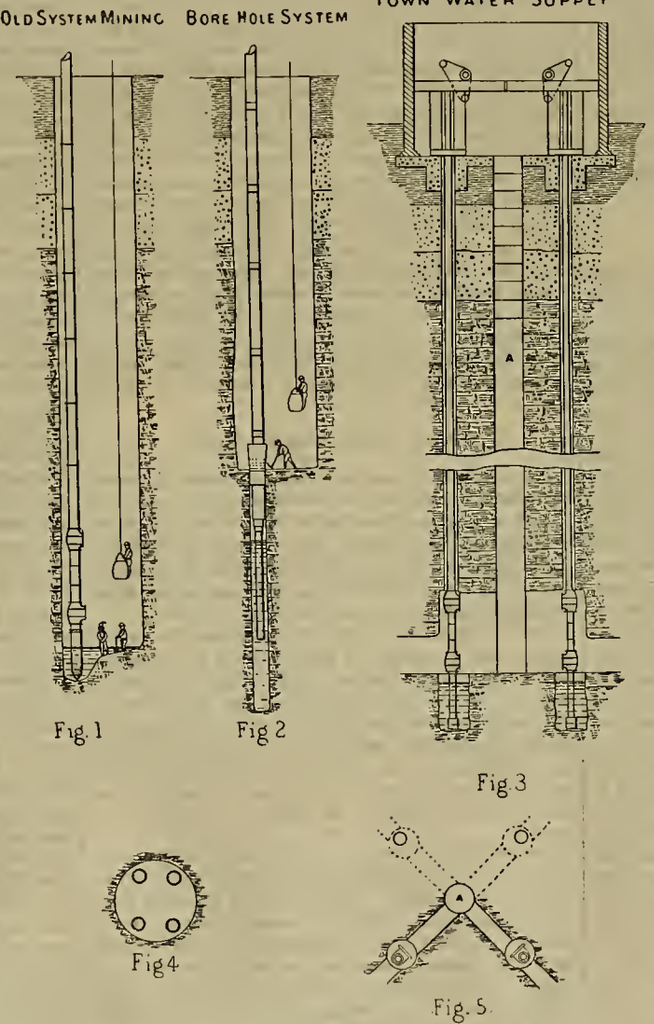
Sinking a Shaft Sump in Advance.

In sinking shafts and wells through water-beering strate in time-honored methods, there is not only great work but considereble time is taken, especially where much water is encountered. Mr. Henry Davey, of the British Association, cells ettention to a simple system of keeping down the weter in water-bearing strata in edvence of the sinking operations, so thet the excevation of the shaft (or well) mey be mede on dry ground. The ordinary method of shaft or well-sinking is to sling e pump or pumps in the shaft and to lower tbe pumps from time to time as the sinking continues; obviously tbe excavetion has to be performed in weter, end if the quantity of weter to be deelt witb is very great, e large portion of the work has to be done by the men working in e deptb of two or three feet of weter. To fecilitete the work, and to reduce the amount of water in which the men heve to work, e sump is mede under the suction pipe of the pump (shown in Fig. 1), end it is the keeping of tbis sump excavated in advance of the other work which is most difficult end tedious. Then there is the deley occasioned by the lowering of the pumps and providing the appliences necessary to the operetion.

In the plen now proposed by Mr. Devey the pump illustreted in Fig. 2 would be placed in a bore-hole mede before the commencement of the sinking of the sbeft. The only novelty in the pump is that of edepting it to the purpose. It is necessery thet debris shell not get down the bore-bole in sufficient quantity to choke it. This is provided against by meens of e heavy taper shield of cest steel, surrounding the pump and resting on the edge of the bore-hole. This shield is perforeted with holes inclined upward toward the pump to allow weter to get into the bore-hole, but to exclude debris. The shield is made very heavy, and by its own weight follows the excavetion around the pump, and also protects it from injury through blesting of the rock. The pump is made without a foot valve, and the rod of the bucket works through tbe seating of a velve which rests on the top of the working barrel. By this arrengement the drawing of the bucket also draws the valve, and should the bottom of the bore-hole be filled up with sand it can be removed by lowering a scoop such as is used in making bore-holes. The bore-hole should be bored to a greater depth thsn that required for the pump, to provide aspace for sand and debris. The application of this pump to the sinking of shafts would be veried to suit the local circumstences and the geological formation of the strata to be passed through. It would prolong the paper too much to go into all the deteils of various applications which might present themselves.



IMPROVED SYSTEM OF SHAFT AND WELL SINKING.

It is quite evident that in some situations the sheft might he obtained by means of bore-holes outside (as shown in plan in Fig. 5), and this is a plan now being carried out in procuring water for supplying towns. It is the usual and necessary prectice to provide duplicate pumping-engines, and where two engines are mede to pump from the same well, the well must be very large, so that it may accommodete two sets of pumps. Such wells are usually 12 feet to 14 diameter, and to sink them in the ordinary way is a very long and costly undertaking, especially if quicksand is met with. Moreover, on completion, it may be necessary to drive adits to increase the water supply. A simple bore-hole is made very cheaply and very expeditiously in the following manner, which is illustrated in Figs 3 and 5: Four 30 inch bore-holes can be put down in e smell fraction of the time required to sink a 12 foot well in the ordinery wey.

These bore-holes eccommodete the pumps for duplicete pumping-engines—e peir of pumpe to each engine. The bore-holes being completed, tbe pumps ere lowered and coupled up to the permanent engines, and immediately the weter found in tbe bore-holes cen be pumped end supplied to the town. Should the supply be insufficient, then e small well would be sunk in the cley to the bottom of the bore-hole pumps. The bore-holes et the level of the pumps would be connected to tbe center well, and adits driven to collect more water. Should the bore-holes yield sufficient water, then there would be no necessity to sink the well. In the section of a completed well, adits have been driven to collect additional water to that yielded by the bore-holes. When such a well is mede, the changing of the working parts of the pumps mey be done under ground, thus obviating the necessity of drawing the pump rods from the top.

THE councils of the Federated Trades of the Pacific Coast end the Building Trades are to be dissolved, and in the place of these a new joint organizetion is to be formed.

Ore Shipments by Sea.

A steemer from Le Paz has brought up 2160 tons of Mexicen silver ore from the Topia mines of the Gurney Mining end Milling Co. to the Selby Leed Works. Tbis is the second shipment from the same source, end ebout 1000 tons e month may be expected in tbe future. Formerly this ore went to tbe Coloredo smelters, and the cbange in destinetion is quite important for this Stete. The steamer on her return takes down supplies for the mines, ell purchased in this city. These sbipments are the result of sending egents down to Mexico to get the ore, a system which hes not been pursued by San Francisco men until lately. The Colorado men heve, however, been reeching out in all directions for milling ore. They heve agents permenently loceted at Mazetlsn and other Mexicen ports to hunt up end purchese ore. The San Frencisco ore-handlers and smelting men ere now seeking ore in Mexican end Central Americen ports, end doubtless this cless of business will increase from this time on. San Frencisco should reelly become e greater ore-reducing center then it is et present. Ore cen be brougbt here both by reil and sea.

The whole northwestern coest is being repidly settled up and developed, end meny mining districts ere being opened south of us. Lower Celifornia, the main Mexicen coast, Central America and South Americe, ere all large ore producers. In most of these pleces the fecilities for beneficiation of ores ere lacking end the producers prefer to sell to millmen or smelters Steemers end seiling vessels from this port visi most of the places along the greet renge of coest line mentioned, end it only requires en effort to obtain the ore trade. The Selby Smelting Co. of this city has fecilities for handling all clesses of ores in quantity, and cen do it cheaply. In fact, by getting the ore by see instead of rail, it ought to be able to do better by the miner then tbe Colorado smelters can with coest ores. These two shipments from La Paz are not only importent from a mining point of view, but are of interest to our merchants as well, since, if the bullion from the ores is produced here, the supplies for the mine will be purchesed in this city.

Profit and Grade of Ore.

In these deys it is not so much the matter of the absolute richness of ore in a mine as the quantity of it. As a general proposition, gold mines which show up ore worth $50 or $60 per ton are scarce, and the ore still scarcer. But those mines with wide ledges, even if the ore is low grade, seem to pay best. Of course, no one objects to rich ore, but quantity is an important factor. The Alaska Treadwell gold mine, Douglas Island, Alaska, during the past year yielded $707,017 in ore, worth by average milling returns only $2 95 per ton. Yet this made a cleer profitof $361,980 on their total yield. Moreover they think they now have 1,200,000 tons of ore in sight in the first and second levels. This mine is a great hill of low-grade ore, but there is plenty of it, so with a big mill and all modern appliances they make money. It is not always tbe richest ore which pays tbe biggest profit.

THE committe of the Overman Mining Co., appointed to consider the advisability of leasing or purchasing a mill, report that it would be to the interest of the stockholders to lease a mill, or if not, to purchese one.

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SAN FRANCISCO, SATURDAY, AUGUST 27, 1892

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Comment.

Dry-washing machines for placer mines are nothing especially new, there having been a number of them invented from time to time. But a good one seems to be hard to obtain. On several occasions of late we have been asked where one could be found. One is in use by the McFarlin Brothers, who are mining on a bar at the mouth of Slate creek, Shasta Co., and Mr. S. M. Whitlow, of that locality, says the machine seems to be doing the work it was designed for. The coarsest gravel is taken out with a sluice fork, and the rest goes through the dry-washer. The machine resembles an old-fashioned fanning mill. Another machine of this kind is that invented by C. F. Willsie, of Salt Lake, and which is now controlled by a Salt Lake corporation. It is constructed with the object of separating flour and other fine gold from sand or concentrates in a dry state. It can be run by two-horsepower, and is said to have been successful with Snake river sand. Its capacity is said to be 100 tons of dirt per day. Another machine is that of John B. Freeman of Los Angeles, who is now at the Bluelight mine, Silverado district, Orange county. Water is scarce there, and he is using his dry-washing machine as a concentrator at the mill. The ore is first pulverized and then sent to the dry-concentrating machine, which handles five tons in 24 hours. About 15 tons of ore are reduced to one of concentrates. This is the first mill of the kind yet operated. The Freeman machine was exhibited two years ago at the Mechanics' Fair in this city, at which time it was examined by the editor of this paper, who saw it handle the material put into it in an effective manner. To do the best work, however, the material must be perfectly dry.

There are a good many miners grubbing away on the smaller camps of this and neighboring States, who have properties they want to sell or to develop, and who wonder why they are neglected and there is no inquiry for their claims. The reason is not far to seek. The miners themselves, talk among themselves, but take no trouble to inform outside people of what they have and what they are doing. Merchants who pursue this course do not sell many goods. A camp to amount to much must be advertised in some way. It takes a very short time to attract attention when a few very rich strikes are made, because things are heralded abroad and people learn something about the camp and the other mines. If our mining friends in such camps as we refer to will occasionally write us about them we shall be glad to publish their letters and help advertise the camp. It is not necessary to have experience in writing for the PRESS. All we want is the facts, and they can be put in shape for publication in this office. Mining men all over the country read the MINING AND SCIENTIFIC PRESS. They see plenty of news from the prominent mining districts, but news from the smaller camps is scarce, simply because in most of them no one takes the trouble to gather the news and send it to a mining paper.

It would be very little trouble for the Gold and Silver Extraction Co. of Denver, which owns the patent rights for the cyanide process, to put up a small working plant in the mining exhibit at the California State Fair, and demonstrate the system to the miners. The process is one which is attracting great attention in this State, and many miners have gone way up to Shasta county to see it in operation at Mr. Paul's mill. There will be a 5-stamp mill and several rotary mills running at the fair, so the ore could be readily crushed. As the process only needs certain tanks or vats after the ore is crushed, an expert manipulator could be present and demonstrate practically the whole system to all who are interested. For the miners this would be useful, as they would bring batches of their own ores and have them treated. They would see the results, and get a good idea of the method of operation of the process. The fair opens on September 5th, but little preparation would be necessary to demonstrate the process on a practical scale.

Another "long lost" placer field is supposed to have been found again. This time it is the placer originally discovered by Stewart and his partner Kit Carson, but which could never be found, though sought for diligently. A party of prospectors came into Spar City, the headquarters of Lime Creek district, Colorado, and report that 19 miles to the southwest of the Lime Creek district, and at the head of Wilson creek, they have found extensive gold placer beds which are as rich as those found by Stewart. The new find corresponds with the meager description old man Stewart gives. He has been back in the territory several times since, but was unable to identify any of the surroundings. Of course, on this report a lot of prospectors started off for the find. There is nothing like a placer discovery to excite a miner; and a second-hand find like this seems to be preferred to an original one. Dozens of such instances might be cited. Men have chased all over the country after the Peg Leg mine and the Lost Cabin and others, and they have been reported found dozens of times. But even these visionary quartz mines will not excite the prospector as much as a report of placer discoveries. The old days of California placers are remembered by all miners, and they want to be first on the ground in the wild hope of finding a second crop of rich claims.

Decay of the Stock Market.

The members of the San Francisco Stock Exchange have decided to abolish the insurance of $5000 on the life of each member, and have decided also to sell the Stock Exchange building, where their sessions are held, at a limited price of $450,000. Thirty-six votes were cast in favor of the latter proposition and 27 against it. If we remember aright, the property cost some $750,000.

It will seem strange to those who remember the days of mining-stock excitement on California and Pine streets to find the Board of Brokers even considering such questions as these. But the fact is the bottom has dropped out of the mining-stock market. For some years it has been in a languishing condition, and of late very few of the brokers are making any money. The rise or fall of securities is now represented by cents where it was formerly dollars, and prices are ridiculous as compared to those in the "'70's."

The Board of Brokers is largely to blame for this result. The fact of a mine being listed at the board was no guarantee of its reliability. "Wildcats" were as readily listed as legitimate mines, provided the requisite fees were forthcoming. Swindles of all sorts were foisted on the public, not by the brokers themselves, but by designing mining sharps, and the brokers took little or no trouble in unearthing them. So in time the public let all the stocks alone, good, bad and indifferent. The rascally transactions which have gone on in the management of the Comstock mines have only met with feeble remonstrance by the brokers if any has been made at all. The resolution to sell the building looks like the beginning of the end. That piece of property holds the members together now more than the business done in it does. Its sale will relegate stock-dealing to merited obscurity. There is little in the business now; there will be nothing then. Perhaps in that event many of the mines which have been kept going by assessments will have to be worked legitimately as mines or closed down forever. The palmy days of stock-dealing have passed in this community. Mining in these days is more of a business than a speculation; and people will no longer invest their hard-earned dollars in certificates the value of which depends on the machinations of the directors, rather than the condition of the property. With the closing of the Stock Exchange will disappear the mill rings, mining combines and merciless, dishonest gangs of operators who have brought disgrace on the mining business for 20 years past.

California Mines and Eastern Capital.

We understand that there is a movement on foot in New York having for its object the investigation of the merits of mining enterprises, and especially of mining stocks put on the market. If such a project is carried out and its management is composed of men of good mining experience, understanding the value of mines and having the facilities for ascertaining the merits of mines offered, it will be a long step toward restoring confidence in the East in mining business and in effecting the investments in mines.

New York and the eastern cities have been so frequently victimized by mining swindles that it literally "killed the goose," and in nearly every instance the promoters of these frauds were not owners of mines nor people from this coast, but sharper residents of those cities. In other words, the swindles have been in nearly every instance home productions. But the mines and the mining community have had to bear the blame for all such transactions, and in consequence it has been almost impossible to effect the sale of a mine or do any business in mines during the past few years in the East.

There is a great deal of capital lying idle awaiting investment in the East that could be profitably employed in mining, and many people owning it would be willing to invest a portion in mines; but prejudice and want of confidence prevents them from doing so. Hence if any method can be instituted whereby the tares could be winnowed from the grain, and every swindle offered be squelched in its infancy, and only really good properties be permitted to be placed in the market, it would lead to a healthy renewal of mining business. There would no longer be a general complaint as now of a want of capital to develop our mines. Especially is such a purifying element needed at this time when there seems to be a growing inquiry in the East for really good gold mines, and here is where California comes to the front as the foremost gold producer, its principal mines being those with gold ores. It seems to be the time for some concert of action between the mining interest of the coast and some organized and responsible body in the East, New York especially, to earnestly enter the field for the promotion of mining interests and mining business, and educate the present generation of capitalists to the profit and soundness of mining; as reliable, respectable and sound a business as any they are engaged in.

The fathers of the present generation of business men East had some knowledge of California and some ideas, even though vague, of mines and mining; but their sons are lamentably ignorant of everything pertaining to either this coast or its business. It is really a case for earnest missionary work, and the whole Eastern community stands sadly in need of proper information on the question of mining. Among all the other attempts to advocate and advertise the products of California, this greatest and most important of all has never had a voice lifted up in its interest.

It is to be hoped that in view of a faint indication of a disposition to look more leniently on mining investments, as is shown by the fact of quite a number of experts having been sent out to quietly look over the ground, that there will be no such exhibition of swindling enterprise as has heretofore prevailed, although, as we say, in nearly every instance it has been the man on the spot that has concocted and carried through the fraud and has simply been the promoter.

Eastern capitalists, in their want of knowledge and in their general belief that with money it is only necessary to name what they want and get it, in the way of a mine, put their standard at a figure that cannot be realized. They want such a mine as is seldom for sale. They want equipped, producing mines. The owners of such do not care to sell, for there are capitalists here as well as elsewhere who know the value of such properties and are content to hold them for the income they bring. It is only when offered more than the value that they consent to sell such mines. The Eastern capitalist wants what everybody here wants, and such as are very hard to find, and, if found, harder to purchase. What we really want of the Eastern capitalist is the money to develop properties that have as fair promise to become profitable, paying mines as those he seeks to buy at a hundred times greater price. Capital so invested is bound to win in the end, for it is but a fair estimate that if he invests in developing five mines, if one out of five proves to be a good mine, it amply repays all the outlay for the five, and is quite as likely to become a bonanza as one that has been developed and which is held at a high price.

It is therefore the aim and greatly desirable that the Eastern men should be made to see the advantages of this more reasonable course to pursue.

Electrical Work in Progress.

THE Buffalo mine in Hog canyon, Sierra county, is to he reopened, and machinery to he run by electricity will he put on and the latest processes for gold-saving will he used.

A FRANCHISE has been granted to Theodor Meetz to substitute electricity for horses on Park avenue, from the crossing of the tracks of the Central Pacific railroad to the southern boundary of Oakland.

THE franchise of the Oakland, Alameda and Piedmont Street Railway Co. has been granted to substitute electricity for horsepower on the following streets, Oakland: Webster, Water, Broadway to Seventh street.

THE ordinances granting to Davie, or Alsop, rights of way for electric roads from the Oakland water front at Harrison street to Berkeley have both been rejected hy the Oakland Council. The Davie franchise was for the system which would operate with the proposed competing ferry line.

IN the Oakland Council an ordinance has been introduced granting to George W. McNear a franchise for an electric line on Peralta street, northwest from Seventeenth street, to the limits of the city; thence from the intersection of Peralta and Horton streets along the southern boundary of Emery tract.

THOMAS HOLMAN has sold his extensive electric light and proposed power plant in Salem, Oregon, to a hig Portland syndicate. The new company will spend at least $1000,000 on this plant during the coming year. They will put in hetter and higger machinery than Mr. Holman intended The work will he pushed at once, and no expense will he spared to furnish Salem with as good a system of electric light as the country affords, and as fine a power plant.

THE Oakland City Council has granted a franchise to the East Oakland Street Railway Company along the following thoroughfares: Commencing at East Ninth street and Fourth avenue, thence along Ninth street to Seventh avenue, Tenth street Tenth avenue, Eleventh street to Thirteenth avenue; commencing on East Eighteenth street at its intersection with Thirteenth avenue, thence on East Eighteenth to the Highland Park and Fruit Vale railroad, thence northerly along the right of way of that road to East Twenty-first street, thence along that thoroughfare to its intersection with the eastern boundary line of Oakland; commencing at the intersection of Eleventh avenue and East Twenty-fourth street, thence on Eleventh avenue to East Twenty-eighth street, thence to Thirteenth avenue, and thence to Hopkins street.

DURING the past three months the North Beach and Mission Railway line has had nearly 200 men employed in laying new track along the Bryant-street branch in this city This road is completed and will he in operation with horses as a motive power during the coming week. This branch commeuces at Market and East streets and runs along the latter thoroughfare to Folsom street, thence to Second, to Bryant, and along that street to Twenty-sixth; there it diverges to Army street and thence to San Bruno road. From Bryant and Twenty-sixth streets a branch has been laid to Folsom street and along Folsom to Stoneman street. Another branch connects from the Bryant-street road to Folsom street at Eighth street. On Second street another connection has been made hetween the two routes. The new lines are all douhle-tracked and the rails used are 65-pound girder steel, the heaviest of any used in this city, Mr. Skelly states that the company will use electricity as a motive power as soon as the courts will permit them to go ahead. Then all its horses will go out of service and electricity will be used on all the lines.

WARM SPRINGS creek, Deer Lodge county, Montana, is harnessed for power already in two places, and the waters are to be utilized twice more. The Anaconda Co. has let a contract for a six-mile flume to carry the waters of the creek. When this flume shall he completed this creek will he furnishing power in four places. In two places it will furnish electric power. The water goes hack into the creek and flows down to the great smelter, where it again dashes against wheels that turn the massive machinery of the concentrators at the lower and upper works. The water again goes hack into the creek unharmed and hut little wasted. The new flume hegins at a point midway hetween Aoaconda and Cahle. It goes down the south side of the mountain to "Coyote" Brown's ranch, where the power station will be located. This station is expected to add from 900 to 1200 horsepower to the refinery. The flume will be six or seven miles long, aod from the power station the electric current will he transmitted through wires to the refinery. The water thus used is turned into Warm Springs creek again and is used to generate the electric power at the present station, ahout four miles from Anaconda. It is understood also that the Anaconda Company has located and purchased water at Race Track, and that another electric power station will he established on Race Track creek and additional power will he conducted to the refinery on six or seven miles of wire and poles.

Mining Briefs.

WORK on the Strahle slate quarry at Kelsey, El Dorado county, has been again resumed and will he carried on on a much larger scale than ever hefore.

THE directors of the Savage mine on Monday received hids for milling the ore. The matter of selecting the most advantageous bid and awarding the contract was left to Directors Wood and Miles.

THE Bay State Mining Co., Amador county, has elected the following officers: W. T. Jones, J. F. Parks, A. J. Crain, I. Kahn, J. Ballard, L. G. Griffiths, W. A. Green; treasurer, Joseph Woolford.

C. E. EDMUNDSON has sold a half interest in the Aurum mine to J. Thayer of Phœnix, A. T., for $15,000. The Aurum is a rich prospect 18 miles from Phœnix. There have been more mines sold near Phœnix in the past six weeks than in three years hefore, and there is quite a little hoom in that region.

THE Genoa *Courier* says a new placer discovery near Signal mountain, northwest of Pine Nut district, Nev., is creating considerahle excitement. Twenty-eight claims have been located.

THE Amador Queen mine was attached a few days ago for the sum of $800, claimed hy San Francisco attorneys as fees for legal advice. The owner is A. S. Cochrane of London and the charge was deemed excessive, and hence the delay in the payment.

THE higgest strike in the vicinity of Creede was made this week in the Shallow creek district on the property owned hy C. J. Roy and named "Old Judge." Roy has a lead of quartz rich in sulphurets which assays from 865 to 1530 ounces in silver.

THE North Buena Vista Oil Company of Kern county elected the following officers and directors at its annual meeting: P. Campodonico, president; G. Costa, vice-president; Charles Cuneo, legal trustee; A. Devoto, treasurer; E. Castagnetto, A. Guclici, directors; E. V. Lonigo, secretary.

THE fugitive secretary of the Bushwhacker Mining Co. of Aspen, Colorado, was arrested in this city Tuesday afternoon. His name is William B. Cochran. The company's directors examined his books several weeks ago, and found that he had overissued stock to the amount of 45,000 shares. The man has been taken back to Colorado to answer for his misdeeds.

SHERMAN PAGE of Los Angeles, one of the owners of the Senator and President gold mines in Gold Basin, A. T., arrived in Kingman, last week. It is the intention of the purchasers of this property to sink a well near the mines and have a horing outfit on the way from California with which to do the work. Should they succeed in getting a supply of water a mill will he erected immediately.

THE Anaconda Company is expending in Deer Lodge county, Mont., one million dollars in improvements to its refinery. The improvements in process of construction are the increasing of the capacity of the electrolytic copper refinery 900 tons per month; increasing the capacity of the electric power necessary to operate the refinery, and the huilding of a new converter. These are vast undertakings and will furnish employment to several hundred men.

THE nine striking miners of the Cœur d'Alene district recently punished for contempt hy the Idaho Circuit Court made a flank movement last week and attempted to escape the sentence hy means of a petition for a writ of haheas corpus addressed to the Circuit Court in this city. After due consideration Judge McKenna denied the writ. The petitioners were Thomas Eaton, John Fitzgerald, Daniel Harrington, Hugh McGee, John Nicholson, Joseph Poynton, Gus Peterson, R. Rohinson and Thomas Whalen. At present they are imprisoned in the Ada County jail of Idaho under the immediate care of Sheriff Ouldham.

Coast Industrial Notes.

RIX & BIRRELL of this city have ohtained the contract for huilding the grand market at Lima, Peru. It will he made of stone and steel and will cost from $800,000 to $1,000,000. A. Page Brown, a San Francisco architect, has completed the plans.

THE difference in the cost of working ores can be conveyed hy the statement that much of the ore sent to the smelters from Tomhstone, Arizona, pays $23 working charges while a large proportion of ore shipped from other claims is worked for $1.50 per ton. Ore running high in lead, or manganese ores clear of silica are among the latter.

A COMPANY composed of some of the principal husiness men of Healdshurg, Sonoma county, has been formed for the purpose of putting in operation the Healdshurg Flour and Feed Mills of this place. The mills are equipped with the latest improved machinery. They were formerly operated hy Streining & Shearer, but for the past two years have been lying idle.

PARTIES have leased 1000 acres of land, lying partly on the Briones Ranch and partly on the Sobrante Rancho, Contra Costa Co., from Simon Blum and G. O. Miner, and will proceed immediately to erect machinery for the purpose of horing for oil or petroleum. The parties referred to are experts in the business, and have hored many wells in the southern part of the State.

TEN immense logs, the largest ever cut in the forests near Tacoma, will he shipped to Chicago to go into the Washington World's Fair building. Each log is 122 feet long and 42 inches across at the small end. Every two logs required seven cars, 35 cars in all heing required for ten logs. One hundred and twenty-six logs will he required for the foundation of the Washington huilding.

THE branch railroad of the Southern Pacific Co. from Bakersfield to the new Kern county oil wells will he completed in a few days. The oil and asphalt from the district can then he readily marketed. A numher of townsites will he laid out along the new line. The natural wealth of Kern county in petroleum products is very great, hut the distance from main lines of rail has prevented much development.

THE purchasers of the Alameda, Oakland and Piedmont Railroad are awaiting the action of the Board of City Trustees regarding their application for additional franchises to know what to do as to a powerhouse. If any of the franchises he refused, they will not need as extensive an electric plant as they will if all are granted. The powerhouse is to be located on Webster street, where the stahles of the old horsecar line now are.

THE hoilerhouse and laundry for the Sutro haths, near the Cliff House, are advanced to the level of the second floor. The roof line of the third story will he on a level with the Cliff House road. The ground floor of the huilding contains two seventy-five horsepower hoilers, the second-floor the laundry machinery and the top apartments are for employes. The exterior of the building is to he artistic and will conform with the hathhouse and so is not of the ordinary hoilerhouse four-wall type.

EXTENSIVE improvements at the Benicia tannery, made under the supervision of the manager, Mr. J. Kullman, douhle the capacity of the institution and make it the most complete tannery on the coast. A new two-story huilding 150 hy 30 feet has been put up to contain the bark leeches or vats, and a new appliance after the manner of conveyors has been constructed to deliver the ground hark to the vats, and to also remove it therefrom, after its strength is spent, to the furnaces, where it is used for fuel. The conveyors deliver the hark from the mill to the vats by an overhead route, and remove it from underneath hy means of trap doors in the hottom of the vats. Two new harkmills and a cutter have been put in. A new two-story engine-house has also been erected, and in it has been placed a fine, large, powerful engine of 125-horsepower with a 14-foot wheel. The new engine will supplant the two small ones which formerly did the work of the institution. A short time ago a new or duplicate set of furnaces was put in and also an additional hoiler.

Personals.

U. S. SENATOR FELTON is expected back from Washington on Septemher 1st.

J. B. LYMAN, superintendent of Con. Cal. & Virginia and other mines, is in the city.

WM. SHERWOOD has been appointed instructor of chemistry at the University of California.

A. B. PIERS and A. D. Kinsley have been appointed assistants in the mechanical department of the University of California.

RAILROAD surveyors supposed to helong to the Great Northern are working southward through the mountains of Modoc county.

C. R. AYRES of Llano Station, Sonora, Mexico, is in the city with the intention of purchasing machinery to drain his mine to a depth of 600 feet.

THE new powerhouse at the Stanford University is to he commenced at once. It will he built of stone like the other structures of the quadrangle.

COL. LYONS of Churntown, Shasta county, has left for St. Louis, to confer with his partners ahout their mining interests in the East Side mining district.

CAPT. TAYLOR of San Francisco was in Redding last week. He is interested with Fred Deakin in some promising mining property in Lower Springs district.

CONGRESSMAN A. CAMINETTI, the author of the Mining Dehris hill, which passed the House hut was not considered this session in the Senate, is hack in California.

L. J. BELL, an active railroad and miniog man of Juarez, Mexico, is in the city on husiness concerning the development of the mining interests of that section of the country.

H. DESY has resigned from the mining department of the University of California, and E. A. Hearson has been appointed in his place with a salary of $1000 per annum.

COLONEL D. H. JACKSON, superintendent of the Holmes mine at Candelaria, who is ill from typhoid fever and was improving, had a relapse last week, hut is now much better.

PETER SCHERER, president of the Tellurium Gold and Silver Mining Co., has made another rich strike on the company's property on Salt creek, Shasta county, this time on the Cleveland.

JOHN BARRY is running his mill at Cerbat, A. T., and turning out large quantities of concentrates. Mr. Barry is working one of the bumping tahles and is making a success with this process.

COLEMAN BROS. of Grass Valley and others have sold to the Morning Star Mining Company of Iowa Hill, Placer county, the waterditch or canal and all the right of way in connection therewith.

PROF. HENRY CLEWS of the astronomical staff of the Lick Observatory has tendered his resignation to the regents of the State University and will leave Mount Hamilton on Septemher 1st.

IT IS understood that Albert Dihhlee will he president and Julius Bandman manager of the new Giant Powder Consolidated Co., formed hy the consolidation of the Giant Powder and Safety Nitro Companies.

C. CUMMINGS from the White Hills, A. T., reports over seventy men at work in camp and that everything is looking prosperous. The mines are developing heyond the sanguine expectations of the original locators.

C. B. WELCH, representing the Needles Reduction Co., is looking over Mohave county, A. T., in the interest of his company to ohtain some accurate information of the amount of shipping ore that can he produced here.

L. E. RICE, in the interest of a Chicago company, which is running an electro-chemical process for the reduction of ores, is at Redding, Shasta county, for the purpose of getting samples of ores from the various mines to he tested at his work.

A NEW huilding to cost $30,000 is to he put up at Palo Alto for foundry and forge work. It is to be divided into three sections; a pipe-cutting shop, an engineering and a plumhing shop at one end, occupying thirty of the 200 feet space, a hlacksmith shop in the center, occupying 94.6 feet and a foundry at the other end seventy-three feet long.

JOSEPH PORTER, who has had charge of the Gladstone mine, Shasta county, since Col. Clark took possession of the property, has gone to Siskiyou county to take charge of the Golden Dawn group of mines the Gladstone company hought of J. H. Dent. These mines are situated in the vicinity of Sawyer's Bar, in Liherty mining district. Frank Saterlee succeeds Porter at the Gladstone.

A Great Camp.

The Character of the Butte District and Extent of Its Properties.

The fame of Butte is world-wide as a mining camp, says the *Montana Mining Jonrnal*. It is impossible to describe it as it sbould be described in a newspaper article, and a large volume could not do it justice. Last year the mines of the camp produced, according to the statement of W. D. Wbeeler, assayer in cbarge of the United States assay office, in Helena, $10,931,812.09 worth of gold and silver, and $14,328,886.05 worth of copper. The total value of tbe output of the camp in gold, silver, copper and lead was $25,261,573.14, yet the Anaconda Company was closed down nine months of that time. These figures tell more than a volume of words.

Butte is situated just west of the main range of the Rocky mountains. A spur runs westerly from tbe main range, at the foot of which runs Silver Bow creek. The valley of tbe creek is about 5500 feet high, and the highest point of the spur is over 6000 feet. This is a large isolated peak, which gives the name to the camp. The average height of the spur, not including the Butte, is ahout 5800 feet.

Veins are found on both sides of the spur, running nearly east and west. On the south side, veins are found all along tbe slope to tbe creek, and on the north side fully a mile and a half from the summit of the ridge. South of the ridge, the dip of tbe vein is to the south, and on the nortb side the dip is to tbe nortb.

As far west as the Butte the country is a coarse, friable granite, occasionally assuming a hardness that defies the disintegrating forces of nature, with occasional dikes of porphyry, called rhyolite. Some persons doubt the existence of porphyry to any extent among tbe granite. The Butte is rhyolite, so far as has been explored West of the Butte the rock is called "Blue Bird granite," from a mine of that name which is found in it. This rock seems to be made up of quartz and feldspar, with little or no mica or hornblende in it. The granite east of the Butte seems to have more mica and bornblende in proportion to the quartz and feldspar.

The veins of Butte vary in size from a few inches to over a bundred feet. They are more numerous tban in any camp of whicb we have any record. As many great mines as there are in Butte, the probability is that many fully as great will yet be developed. The veins are generally well-defined, though in many instances tbe walls seem to have been mineralized at tbe same time the contents were. The walls are generally softer tban the rock some distance away, and wben miners find the rock getting softer, they expect soon to encounter a vein. The copper veins, wbich are the largest, lie almost in tbe center of the district, north and soutb, and seemingly run eastward across the valley. Good copper prospects are found in the valley, and across the valley, in line with the great leads, good prospects of copper are being found, and experts believe that some good copper mines will soon he opened up east of the creek. So far, no copper of any consequence has been found in or west of Missoula gulcb. In the northern and southern parts of tbe district the veins generally carry silver, though some of them produce a fair proportion of gold.

Silver Bow creek was once good placer ground. It would seem that near the surface, before the erosion of the spur, the veins must have carried a great deal of gold. In fact, most of the mines opened show a great deal of gold near tbe surface. As the rocks were eroded, tbe contents of the veins were carried down into the valley; but as depth is reached, silver or copper ores become the rule, though all carry more or less gold. The most common ore is a sulpburet of silver, or silver glance. Tbere is a good deal of ruhy silver, and often native silver is seen. One or two properties carry considerable lead, and zinc is found in many of them. As a general rule, the zinc ores carry but little silver, but tbere are exceptions. In tbe Gagnon and Vulcan mines zinc ores have been found that ran very high in silver.

Tbere bave been statements that the ore bodies of Butte are confined to the surface, and that with depth they become poor, and that at greater deptb they will probably he too poor to work. Tbere is no good reason for such apprehensions. Mining men know that the shoots of ore that are of equal value tbroughout their strikes and depths are phenomenal. If tbe ore of Butte showed what some ill-informed and captious people think they ought to show—equal value to the deep—then would Butte be the most interesting as well as tbe most productive camp tbat any one could hope to see. Tbere are no such ore shoots that we bave heard or read of, and no good mining man expects tbe ore shoots of Butte to show any better comparatively than the generality of veins tbe world over. The deepest sbaft in the camp is less than 1600 feet, and the explorations made give no apprebension that the veins are not permanent and tbe ore shoots not as good as have been found in the deep elsewhere. Assertions bave heen made tbat it is doubtful if any Montana mines will sbow as well at depth, hut the deepest mines of the State, so far as explored, go to disprove any such idea. Of course it cannot he known what our mines will show till the deep is reacbed and explored, but what has been done warrants furtber exploration, just as the work on the surface warranted tbe owners to go down on the veins when they were discovered. The question as to how veins were mineralized has heen brought into tbis discussion, but it cannot he supposed that the veins in our mountains were mineralized in any different manner than were the veins in other mountains of the world. But even if the veins of Butte should he proven to he too poor to work at depth, there is sufficient ore in the camp, witbin a thousand feet of the surface, to give employment to the people who are tbere or who are likely to he there, hundreds of years.

The developments on the Vulcan, which produced so much high-grade ore, have called attention, during the two years past, to the veins of the valley. The Star West is a great producer of low-grade ore, and the Ophir seems to be the making of a good mine. The Olive Branch, farther south and west, is showing up well, and gives evidence of being a paying property. Numerous prospects which have been worked in the same locality look well, and the south bids fair to equal the north of the camp in tbe production of silver, tbougb the ore is smelting instead of milling.

Tbe future of Butte is assured; the most sanguine believers in the camp are more than likely to have tbeir expectations realized, and the camp is so great that the croakers, even if heard, have no attention paid to them. No interested purchasers of Butte properties, nor paid experts, nor growlers can have any bad effects on its fortunes, and it will continue to he in the future, as in the past, tbe greatest mining camp in the world.

How Paper is Made.

In none of the mchanical arts has greater progress been made in recent years tban in the manufacture of book and magazine paper, many tons of which are used in this city every montb. Years ago, tbough not too long to endure in the memory of "the trade," the process of converting the raw material into the hard-fibred and smooth-surfaced paper essential to the needs of tbe higber class publishing houses was a task involving many days of constant care and much manual labor. To-day the process is extremely rapid, the paper is infinitely better than before, and much of the manual labor that was employed in the days of our fathers has been supplanted by tbe labyrinths of swift-moving machinery.

It would be difficut to imagine a more surprising metamorphosis tban that by whicb the native timber on the Pennsylvania hills is converted, in seven hours, to a sheet of clear, wbite paper ready for the press. Yet tbis, in brief, is the process that is going on at tbe New York and Pennsylvania Company's mill at Johnsonburg in western Pennsylvania. This mill is the largest book-paper-making establishment in the world. It covers several acres of ground and almost as many acres of machinery. Sixty cords of timber are thrust into the choppers, and 90,000 pounds of paper are shipped from tbe yards every day, to be cut, printed and placed in countless libraries throughout the land.

Tbe chopper, where the conversion of wood into paper begins, is a sort of guillotine. There is a sharp blade of massive proportions, moving swiftly in a groove. Everything that comes heneath the knife is severed. Occasionally a tough knot that has withstood the blasts of many a winter is tossed in, only to suffer tbe fate of the sapling that went before. Every stick that goes in comes out in the shape of chips no larger than a man's hand. The wood does not lose its identity, however, until the next stage of tbe process, whicb is known as "cooking." Tbere are several large digesters, containing caustic soda, in whicb tbe chopped wood is placed and cooked for five hours, this being the longest single process to which it is subjected. From the digesters it is hlown into a large tank, its consistency being thick and heavy, and its color an ugly hrown.

Tbe soda having heen run out, the pulpy-cooked wood in the tank is washed down with hot water and thoroughly cleaned. Tben it is dumped into a large chest, cleaned again, and, having been pumped into a screen which removes splinters and debris, it is run into wet machines and in a measure dried. The "stock" emerges from these macbines an unbroken sheet of light, hrown pulp, resembling soaked hirch bark. As it falls from the macbines, it is taken on carriers to four bleachers, eacb holding 4000 pounds. Here it is treated with chloride of lime liquors until tbe desired whiteness is obtained.

By this time one hegins to see how it is possible to make paper from wood, for the "stock" has already assumed a beautiful white color, and its consistency is of a soft, pulpy sort, very mucb like boiled starch and not at all like wood. Squeezed in tbe band, however, there remains a dense fibre that clearly shows the stuff of which paper is made, and establishes the link that hinds the pulp in the tank to its parent timber on the neighboring bills.

A pulsometer pump, close by the bleachers, next drives the white mass into 15 large storechests, each bolding 8000 pounds. It is held in the chests until the beating engines are ready to give it a shaking up, preparatory to its final transition. Tbe stock, wbich is now called "half-stock," here receives its coloring-material and sizing. If blue, yellow, pink or other color is desired, this is the stage in the process where the coloring-material is applied. The "sizing," wbich consists of resin and an alkali hoiled together, is used to give the paper the desired resistance to atmospheric influences. An alum is used, wbich separates the alkali from the resin in minute particles, and while passing through the calenders or the paper machines it fuses, thereby completely covering the sheet with a film, whicb effectually resists the influences of the atmosphere. Clays are used to make the paper opaque.

From the heaters the "half-stock" is passed into a large chest holding 4000 pounds, containing an agitator turning at the rate of 12 revolutions a minute, and thus keeping the stock in a uniform condition, preparatory to its passage to the refining engines. Tbese engines, two in number, supply a 106-inch paper machine, which marks tbe heginning of the end of tbe metamorphosis. Having passed through a sandcatcher to a receiver or mixing hox, the stock finds its way to tbe great Fourdrinier machines. Still in a liquid state, it is passed to an endless wire screen and a vihrator, where the water is then taken from the partially-formed paper by means of three suction pumps. Tbis screen contains 70 meshes to tbe square inch, and is 40 feet long. By the time the stock leaves the screen, its transition to the paper state is clearly defined, though there is still a long line of humming machinery through which it bas to pass. The primary stages, however, are over.

A ten-inch "dandy" roller now gives the paper the same shape and surface on hoth sides, and if necessary supplies it with the watermark. Tben it passes to two couch rolls covered witb woolen jackets, and tben to a 32-foot endless Bredt wet felt, where tbe remaining water is pretty effectually pressed out. As there is some water remaining, another felt press is resorted to, and then the paper is ready for the drying cylinders, 15 of which, each 48 inches in diameter, and heated by steam, relieve the paper of the last of its moisture. A cloud of steam rising from these cylinders, as they slowly revolve witb their white coverings, shows that some moisture still remains. But the cloud grows less and less dense as the last of the cylinders is reached, and by the time the paper reaches the calenders it is as dry as a hone.

These calenders are chilled-iron rollers, which give the paper its desired finish. From these it passes to six revolving reels and then to the cutting machines, where it is cut in any shape or size preparatory to shipment. While this interesting process is going on, the caustic soda, used in cooking the wood originally, is hy no means forgotten. This soda is somewhat expensive, and ahout 65 000 pounds of it would be lost if it were not recovered. Accordingly it is drained through the bottom of the tank, to be subjected to a remarkable series of process which eventually restore it to its original condition and to 90 per cent of its original volume.

From tbe storage tanks it is filtered through sand, and then run to a hoiler where it is heated to 170° preparatory to insertion in the Yaryan evaporating machines.

These machines may be said to have revolutionized not only the paper-making industry, but every otber industry as well in which processes similar to that of the recovery of the caustic soda are involved. The Yaryans contain 22 coils traversing tbeir entire length. The liquor enters the coils at 22 different places, and travels through eacb "effect" five times. Then it passes out into the head, drops down, and goes tbrough into the second effect, while the steam passes out. Thus, the steam arising from the hot liquors helps evaporate the liquor in the second effect, where the operation in the first effect is repeated, the steam passing around the flues and the liquor passing through tbem. By the time the third effect is reached the liquor is of the consistency of molasses, containing a very small percentage of water, and consisting for the most part of soda and resin.

After leaving the third effect it passes into a storetank and is drawn off into four "rotaries," whicb are simply revolving cylinders, eight feet in diameter, lined with firebrick. The liquor runs in at the hack of these cylinders and coats the inner surface, while a natural-gas flame at the front sets it afire. In this way the resinous substances are burned out completely, so tbat when the erstwhile liquor emerges at the front-end of the rotary it is a cberry-red asb, consisting of carbonate of soda mixed with the carhon of the burned resin. Dropping from the rotaries to an endless chain, the ash is carried up to the leacbing battery, consisting of six tanks, in which the soda is leached out of the ash by hot water.—Manufacturer and Builder.

Shasta County Mines.

SHASTA, Shasta Co., Aug. 16, 1892.

TO THE EDITOR:—Shasta county is now having a lead boom. The Bell Bros. of tbis place have a lot of lead claims honded about ten miles east of Old Furnaceville, where Mark Peck flourished in the early seventies, that are fine-looking prospects. The ores go 40 to 65 per cent lead and average 100 ounces silver per ton. It is said millions are in sight. However, it is a promising field, and development work will show up something good. Major Lyons' mine, nortb of Old Diggings, is the prize ore-producer. The major has five feet of ore that samples $400 in gold and silver. He contemplates putting up extensive works soon. The Quartz Hill mines continue to put out large quantities of good ore, and Hart's mill keeps up a steady grind. Two years have now elapsed without a stop. The large croppings just south of the Walker mines, Old Diggings, have proved a surprise to the camp within the last week. A shaft sunk 130 feet and a crosscut run 50 feet show no sign of walls. Tbe ore is liberally spattered with gold, and tbe San Francisco outfit which have it bonded for thirty thousand, figure out over a million in sight, which is certainly no overestimate. Pete Sheavers' Cleveland mine is one of the phenomenas of the district. He has a cbute of tellurium gold rock that assays from $5000 to $8000 per ton. Paul's cyanide mill is at a standstill just now.

F.

SOME important improvements, wbich will greatly increase the traveling facilities in tbe Yosemite valley and enhance its beauty, are being considered by the Yosemite Valley Commission. At the last meeting of the executive committee, Professor Lowe of Pasadena was appointed to investigate the practicability of huilding an electric road through the mountains for the transportation of tourists. Secretary Irisb states that there is abundant waterpower to run a sufficient number of dynamos to ligbt the entire valley. It is proposed to utilize part of the current for electric light purposes, and the larger and more picturesque falls are to he lit up at night in a similar manner as are the great Niagara Falls, introducing a novel feature which will prove a great attraction to travelers coming to the State.

AT the State Prison, at San Quentin, work on the new jute mill is progressing as rapidly as can he expected. Tbe walls are nearly completed. Tbe full force of prison carpenters will he put to work on it and no difficulty is anticipated in getting the entire building under cover before the first rains set in. A portion of the looms have heen received from Oakland and properly stored, and the Warden is in receipt of hills of lading from England for the spinning machinery of tbe mill, ordered through tbe Union Iron Works.

Origin and Functions of Humus or Decaying Vegetable Matter.

Translated from the German of Justus Von Liebig by Professor Granville F. Foster.

Antioch, Cal., Aug. 23, 1892.

All plants or portions of plants after the termination of life undergo one nr the other or both of two processes of decomposition, one of which is known as *fermentation*, the other as *putrefaction*, both similar processes, the latter, however, taking place nnly in materials containing albuminoids in some form.

Each nf these so far as the changes are concerned is only a slow combustion, the portions having an affinity for oxygen entering intn composition with that element during a course of days, months nr years, which process is often completed in burning in as many minutes or seconds. (It is now known that each of these two processes are developed and carried on hy appropriate micrnorganisms which cause the chemical changes for the purpose of appropriating elements necessary to their own existence.—Translator.)

The decomposition of the chief constituents of all vegetable and nf all kinds of ligneous fiber presents a phenomenon nf a peculiar kind. Surrounded with air and hence with oxygen in contact, the oxygen absorbed is converted into an equivalent volume of carbon dioxide (formerly called carbonic acid gas.) The process ceases whenever the oxygen is exhausted from the contiguous air, but is renewed whenever oxygen is again supplied. But in the case of humus, the process is not carried to the length it is in ordinary combustion, though as far as it goes it is of the nature of that combustion, for the time comes in any particular mass when the absorption of oxygen ceases even when surrounded with a plenteous supply of that gas, and the humus becomes, under ordinary circumstances, an unalterable brown or coal-hlack mass known in common parlance as mould. This then is the first and most important product in the decay of wood. It is the chief constituent of all sorts of peat and turf. By great pressure it can be reduced to hituminous coal and hy heat and pressure to anthracite. But hy contact, however, with alkalies, lime and the like, the decomposition of mould can be carried further, rendering much more carbon dioxide for growing plants.

In a soil which in its depths is accessible to the air, the action in the humus will be just like that which takes place when the mass is exposed to the air at the surface, and here as elsewhere oxygen is slowly exchanged for carbon dioxide.

Each little particle of decaying vegetable matter is surrounded with an atmosphere of carbon dioxide which it has obtained at the expense of the air on one hand, and of a part of its own weight of carhon on the other. Now, in the cultivation of the ground, *here is the philosophy* of constantly loosening up the soil for this process renders the access of air to the depths beneath free and unhindered and thus often promotes the production of carbon dioxide to an extraordinary degree

It is without doubt true that in the earliest development and growth of plants carbon dioxide is not needed. Before the development of the leaf with its cells of chlorophyll, the plant is unable to assimilate the carbon dioxide of the air. At the expense of the reserve material and the little plant germ, packed away in the seed grow the primitive organs of the new plant, the first roots and leaves (the radicle and plumule.) But once the leaves are formed then commences the assimilation of carbon dioxide.

Now remember that the matter stands thus, no plant growth can take place without either free carhon dioxide at hand or some material with this gas exhaling therefrom applied to the roots, hence, the great store of this gas in the soil from wbich the roots can draw a supply is a thing not to be undervalued. Humus promotes plant growth not then by being itself absorbed in a soluble form and thus becoming assimilated, hut because it furnishes in solution carhon dioxide, and other indispensable plant-growth-promoting elements, all of which the roots can find at hand to absorb so long as the conditions of decay, moisture and oxygen are united together in their action upon the humus.

As the carbon dioxide is passing up in the sap from the roots, there ls a considerable portion that passes to the outer air hy diffusion, and hence it is readily understood that plants, which shade with their leaves the ground as with a thick ceiling or roof overhead and hence retard or prevent the air rich in carhon dioxide beneath from heing driven away or interchanged with the outer or upper atmosphere, have a large supply of the gas to breathe in through their leaves to he here changed into carbon for the growth of the plant and into oxygen to he hreathed out into the atmosphere. Let it he remembered here that the humus contains also as a residuum of the decaying vegetahle matter, all the nitrogen the plant will need, hut even this is supplied hecause of the decomposition that goes on that chiefly supplies carhon dioxide.

Notes by the Translator. When Liehig wrote the ahove, the grand discoveries made in the domain of microorganism were all matters of the future. Not only is it now known that fermentation and putrefaction are caused hy appropriate microhes, hut that numerous diseases now generally known as zymotic, are also so caused, hence the wonderful revelations of Dr. Koch, of Berlin, and Pasteur, of France, and others who have followed these leaders, hut these discoveries in no way invalidate the description of the processes of decay or their relationship or result as stated hy Liehig. It will make no difference as to process or result to say that the oxygen of the air has a very great affinity for the carbon and hydrogen in the materials of which vegetable and animal frames are composed, and, hence after death hecause the composition of these materials is very compiex, the oxygen succeeds in easily oxygenating the carhon and hydrogen, thus npsetting the stability of the compounds which thus separates up into two or many divisions, a process known as fermentation nr putrefaction as there should happen tn be nn albuminous material or the reverse in the compound, the old view, or to say that micronrganisms or microbes in the course of their life history for the very necessity of their existence, demand certain elements in the compound which being appropriated upsets the stahility of the compound which thus separates into two nr more divisions, known as fermentation or putrefaction etc., the new view The cause has heen discovered, that is all. The earlier chemists not knowing the cause, and needing one, endowed oxygen with a sort of life, a disposition to destroy all complex organic material and set it to work to restore to the air all the gases derived from it by the processes of plant growth.

Liehig in making humus the chief source of carbon dioxide did not mean to ignore the enormous source of this gas in animal breathing, in ordinar y combustion and in many cases, in volcanic action, all of, which is absorbed from the air by the leaf. What a wonderful little laboratory do we find in the chlorophyll cells, for with the sun's ray as a chemist, and carbon dioxide as the material, carhon is made for the growth of the plant and oxygen thrown out into the air. The human chemist by much labor can separate carbon from the oxygen in this compound, but he has only the carbon for his pains, for the oxygen gnes off in affinity with some other element or if he get the oxygen, the carbon goes off with some other element. In other words, the human chemist cannot divorce carhon and oxygen without at the same time marrying one nr the other to some other element, but the sun's ray does it perfectly and yet so silently that you hear not the sound and know not how it goes on.

In Liehig's day it was helieved that plants could not assimilate free nitrogen from the air, but could get it only from ammonia or other compounds of nitrogen either in earth or air, but chiefly in the former. It is now known that nitrogen in small quantities can be assimilated by the plant directly from the air, and that various compounds of this gas, so very necessary to life of all kinds, vegetable and animal, are actually manufactured from the air. In Liebig's day it was helieved that it was only possihle to make the nitrogen of the air to unite chemically with the oxygen of the same, by passing through the air intense sparks of electricity which would thus produce minute portions of nitric acid which, brought down hy the rain would be at hand for the use of plants, but this source is very meager and does not halance the decomposition of ammonia nitrates which keep supplying the atmosphere with more nitrogen, and if this destructive work was continued the time would come when the earth, with no change in climate, would not have a supply of compounds of nitrogen sufficient for an increase in either the animal or vegetable population of the world, but the balance is kept up, the cycle is perfect.

Machine Lubricants.

Useful Hints to Engineers and Users of Machinery.

While the engineers of the present generation have realized that the question of lubricants for machinery has to be cnnsidered from a more serious point of view than obtained half a century ago, a good deal of ignorance still prevails upon the matter. Theoretically, a lubricant is simply a necessary evil, inasmuch as nearly every substance so employed has a tendency to "gum." In practice, however, lubricants are found heneficial and their excellence depends partly upon their inability to absorh oxygen and partly upon the ahsence of "gumminess" when subjected to friction. When the steam engine, and consequently the heavy machinery which its use rendered practicable, was first introduced, animal and vegetable oils were almost exclusively made use of. It was some time before it was discovered that these fats were eminently unsuitable for mechanical purposes, and the attention of power users became turned to mineral oils. Their superior penetrating powers very soon recommended them, but it was many years before engineers generally could be brought to believe that heavy "greasiness" was not the most essential characteristic of a lubricant. Vegetable and animal oils, consisting as they do of fatty acids combined with glycerine, were presently discovered to be injurious. The decomposition set up hy age released the acids, and the rancid condition then resulting was found to "eat" into metal The first step toward reform was to mix these with a certain proportion of mineral oil, whicb retarded decomposition and made them spread and penetrate better; hut even then the lubricant produced was not exactly satisfactory. A well-known American writer states truly enough that the blending of mineral and animal oils does not merely consist in shaking them together, as is supposed hy many, hut as they are of different gravity, the glohules of each must he hroken and run into each other hy agitation and heat, so that the oil will become one hody. If this he not done, the animal oil will become separated, and standing in a heated room, the had qualities will become manifest, and later, when used, the oil cannot do its work, and at once the quality is condemned. "I had a case," he continues, "where a large millowner was using oil said to he one part sperm, and three parts paraffine, of heavy gravity. The price was lower than I knew it could be made for. Upon analyzing a sample drawn from the harrel, I found it contained 60 per cent of sperm and 40 per cent of paraffine, showing that the oil was separating. The sperm oil heing lighter, was coming to the top." Such oils cannot give satisfactory results.

A writer in the *American Engineer* gives some very useful hints regarding this suhject: A good oil, he says, should he used as sparingly as the nature of the hearings will permit. The amount of resistance (friction) generated hy the hearings depends upon the numher of revolutions a minute a machine is capahle of making, and the amount of power necessary to run it. In the use of oil, uniformity of distrihution is as important as the regularity of supply. A dry spot on a bearing will at once cause heating, and if allowed tn continue, cutting will be the result. There is no department at a cnlliery more important than the engine-room. As the diminishing of friction will naturally result in gain of power, it is to the consumer's interest to learn by careful experiment the oils that are hest adapted to run his plant, and to make the necessary tests of density, fire test and viscosity. By so doing he can be certaio to receive exactly what his machine requires, and run it at the lowest possible cost. "Poor oils," says an eminent engine builder, "are a prolific source of injury, and often defeat the purpose for which a machine was intended. If a machine is not properly lubricated, it will bind, heat, and then cut, and the percentage of work added is sure to injure the engine, and certainly needs an extra dip now and tben into the coal pile."

An important point made by the writer is that no oil has been made that can economically luhricate all the journals of a mill. An oil running a heavy engine would not do to run a spindle or fast-revolving dynamo. The former runs slowly and has great pressure and strain on its journals, and consequently requires an oil that will not spread too quickly, but with low gravity and high viscosity. The latter needs a pure mineral oil, viscous and quick-spreading, to enable it to enter into the closet parts of the bearing as rapidly as the speed at which it revolves necessitates.

In making an oil for a specific purpose, the speed, power, pressure upon the journals, mode of application, and temperature at which it has to run, should be known. This information in hand, an oil can he made to suit.

The conclusion at which our contemporary's correspondent arrives is, tbat either mineral oils alone, or a mixture of mineral and animal oils, are the safest and most satisfactory for the purpose in view. The concluding paragraphs of the paper are worth the most careful attention of power users. Experiments have shown that gumming is due to the action of free acid upon the metal-bearings of machinery.

The corrosion of bearings hy oils has not received the attention it deserves, as the wear and tear of the metals and thickening of the oils has been attributed to other causes. Liquid oils corrode metals very evenly, so that the effect is not readily observed. Mineral oils contain no acid, unless they have been carelessly refined.

Mineral lubricating oil has the least action on metals; none on iron or hrass. Tallow oil has most action on iron; castor, olive and lard oils have most action on brass. Rapeseed has most action on copper.

According to experiments hy Galletry and Coleman, it was found that mineral lubricating oils diffused through textile cotton do not take fire even at a temperature at which colza oil ignites, and that fatty lubricants, to which 20 to 50 per cent of mineral oil was added, were therehy prevented from igniting.

Spon says: A mineral oil flashing below 300° is unsafe. The best oil is that which has the greatest adhesion to metallic surfaces and the least cohesion in its own particles. In this respect fine mineral oils stand first. No oil is admissible which has been purified by means of mineral acids. Mixed oil, if properly compounded, possesses the special advantages of hoth classes.—Discovery.

American Armor Plate.

The results which have been achieved in the latest tests of American armor plate must surprise even those most familiar with the work which our manufacturers and inventors have been doing along this line. Stated in brief the facts are that a 10½ inch nickle steel plate, its surface hardened by the Harvey process, received without any injury of importance the impact of five sharp-pointed chrome steel projectiles, each weighing 250 lbs., and moving at the rate of a mile in three seconds. Each of these heavy missiles struck the plate with an energy of 5,644 ft. tons, an amount of energy equal to that of a railway train of 420 tons (or say a ten-wheel locomotive and ten loaded freight cars) moving at a speed of 20 miles per hour. Yet not one of the five projectiles caused any cracks of the plate or was ahle to penetrate into it farther than about three inches, though five much lighter blows shattered similar plates less than two years ago, which were then regarded with justice as a great advance over previous practice. It would be difficult to find a more impressive illustration of the possihilities of comhined toughness and hardness which exist in modern steel. Those who still insist that steel is essentially a brittle metal should give careful consideration to the results of these tests.

It must he said that this test, taken in connection with the tests made hy the naval officers on a twin plate which showed results not so good, hut much better than anything before attained, proves more fully than any previous test has done the value of the Harvey process. This process consists of carbonizing the surface of the plate hy heating it to a high temperature in contact with charcoal and then hardening it hy a water hath This process in connection with the use of nickel, which toughens the steel and prevents its crackiog, has enahled American manufacturers within less than two years after heginning operations to produce an armor plate far superior to anything which the European manufacturers, with all their long experience, have as yet heen ahle to turn out. Certainly such achievements in metallurgy will he fruitful of results in peace as well as in war. Mr. Harvey was a prolific inventor in other directions before he turned his attention to the treatment of steel, and we hope to see him apply his process to other materials than armor plates.

The success just recoröed is another of many evidences that America is fast taking the lead of all other countries in metallurgical progress. At the present rate of advance the time is near when our manufacturers will hegin to compete successfully with those of England for the orders of foreign nations for ships of war and war materials. And until plates of similar quality to those just tested are produced in England it would seem as if the question of price would be a secondary one.—Engineering News.

Mechanical Progress.

Ventilation of Engine and Boiler Rooms.

The proper ventilation of engine and boiler rooms, though usually neglected, is a matter of great importance. The heat generated in these rooms from the combustion of the fuel, from the radiation of the furnaces, boilers, steam pipes, heaters, engines and dynamos, is intense. Furthermore, there is a smell of oil, and of escaping vapors of steam and of paint under high temperature. The detrimental effect of these conditions is felt in various ways. Heat and noxious vapors are transmitted to rooms adjoining and above the boiler and engine rooms, and are offensive to the occupants of the building. Frequently ducts which are presumed to transmit cold air to other rooms in the building pass through the engine and boiler rooms, and thus the air is heated in transit, and enters these rooms warm instead of cold, as desired, and the beneficial effect is lost. Again, in electric plants, the dynamos become inefficient when the temperature of the room is excessive. Lastly, and not least, the engineer force suffers exceedingly, which is not only annoying and detrimental to the health, but results in less efficient handling of the plant, for men cannot do their best work and look out for their employer's interests under conditions which cause them physical and mental discomfort.

Any proper system of ventilation of boiler and engine rooms, especially if the rooms are located in cellars of large buildings, requires the bringing in of fresh air to dilute and cool the atmosphere in the rooms, and requires, at the same time, the exhaust of air from these rooms. Either system alone will not answer. If air is supplied under pressure and no proper exhaust provided, it is true the room will be somewhat cooled and freshed, hut the still heated air and noxious vapors will be distributed with greater force to the rest of the building. If an exhaust system alone is used, and it is sufficiently powerfu', the heat and the noxious vapors will be partially removed and will certainly not distrihute elsewhere than in the room, but the air which will be drawn into the boiler and engine rooms will not necessarily he pure air and certainly not cold air, and thus the temperature of the room will not be sufficiently lowered and the air not be fresh enough. If one system alone is to he used, the exhaust is the hest, but neither system alone really meets the need.

The most satisfactory way of bringing in the air is to distribute it by means of galvanized-iron ducts to various portions of the room, not as is frequently practiced, by having one large inlet at one end of the room. These galvanized iron ducts should have outlets at those places where the men are principally at work, for instance, near the engine cylinders, near the dynamos, near the furnaces, and preferably, the horizontal transmitting ducts being near the ceiling, there should he funnels with registers or dampers led to a height just above the men's heads. The transmitting fresh-air ducts in the engine and boiler rooms should be well-covered with nonconducting material, for it is essential, especially in the summer time, that the air which enters the hoiler and engine rooms he pure air from without, and not of higher temperature than the external atmosphere. To create a proper circulation, the exhaust system from the boiler and engine rooms should also he arranged with corresponding outlets at the various parts of the room, these outlets connected by galvanized-iron ducts with the main exhaust flue. Thus is insured a circulation and distribution of air to all parts of the room. The galvanized iron vent-ducts do not, of course, need to he covered with nonconducting material. All the inlets and outlets should have their separate shut-off registers or dampers, so as to be easily under control of the engineer.

There can be no hetter investment for the owner of a steam and electric plant than to have the engine and hoiler rooms properly ventilated. The first cost of such an instition will bear him a handsome return in the smooth running of the plant, a greater fuel economy, in the increased comfort of the tenants, and the greater welfare of his employes.—Alfred R. Wolff, M. E., in Cassier's Magazine.

METAL RAILWAY TIES IN BELGIUM.—In connection with the recent announcement that steel ties had proved a failure on the Pennsylvania railroad lines, the latest on the matter from European authorities is quite interesting. Mr. Janssen gives in the *Revue Generale des Chemins de fer* a brief summary of the five years' experience of the Belgium railroads with metallic ties, in which the results were equally unsatisfactory. Mr. Janssen's statements are these: Two patterns of metallic ties were used, hoth of the same weight, 165 pounds, hut of somewhat different cross-section. The flange rails, weighing 76 6 pounds per yard, are fastened to the ties hy movable clips and holts and nuts. There are 12 ties to a 9-meter rail. Careful observations were made on four sections of track with metallic ties, and one section of track with half-log, creosoted, oak ties.

It was found very difficult to keep the metallic tie track in good shape, particularly as the stone ballast was ultimately pulverized by the ties, necessitating the addition of new ballast in 1891. The metallic ties are themselves in damaged condition, owing to cracks which start at the bolt holes. Out of 250 ties of each pattern which were carefully examined, 77.5 per cent of the Braet form were more or less cracked, and 17.9 per cent of the Post type were similarly damaged.

Up to the time of making this report the track with metallic ties has cost for maintenance, about 19 times as much as the track with creosoted oak ties. Beyond this, many of the metallic ties are damaged to such an extent that they must soon he removed.

Cellulose Bottle Shells.

Raw cellulose is said to be supplanting straw in the manufacture of bottle shells in France. The material is taken just as it comes from the machine—in sheets—and stamped with fairly deep indentations of oval shape and one by one-half inch in size. To form the shell, the sheet is first cut into desired size, enough being allowed to go around the bottle twice, and grasped with the hand, is passed around twice with the raised surface out, and fastened at top and hottom with metallic springs. The indentations are made so that when the cellulose is ro'led together, they do not all set into each other, hut generally upon the flat surfaces between the protuberances. The result is that great elasticity and power of resistance is afforded the shell when on the bottle, and, indeed, the latter may be thrown upon the floor upon its side without fear of breakage. It also fits the bottle tightly, and the latter will not slip out when being handled. The inventor of this device claims many advantages over the old straw shells. In the first place, it requires less room, thereby effecting a slight saving on boxes. There is less breakage. Cellulose is more durable, is a nonconductor of cold and heat, and does not decay nor become dirty and foul-smelling when moist. The shells of cellulose, it is true, cost $1.25 more per M than do the straw ones, but in the end are cheaper, as is seen by the above, and, moreover, may he worked over into new shells after being once used. The inventor of the improved shell is a Frenchman, and it is stated that he has sold the exclusive right to manufacture to a large concern at Mayence.

METAL TIES NOT A SUCCESS.—The officers of the Pennsylvania Railroad Company have come to the conclusion says the *American Manufacturer* that the metal ties which they have been experimenting with for the past 15 years are not a success, and have given orders that all that are now in use shall he taken up and the old style of wooden ones substituted. The company had metal ties placed at a number of places along the lioe, and experience has shown that it is almost impossihle to keep them in place especially on curves. They were rigid in their action, solid in their hearing, and generally got in a shaky and uneasy condition as they took a poor hold on stone ballasts. Moreover, it is asserted that wooden ties have unchanged in price for many years past. So far, wood seems naturally applicable to railroad cross-ties. It forms a cushion, deadens the sound, is cheaper than any metal or composition which has yet been found. The Pennsylvania Railroad Company has not only tried the best makes of metal ties of this country, hut imported a number from England, the best known standards in use. The standard metal tie of the London and Northwestern Railroad Company was tried, but the heavy traffic on the Pennsylvania railroad soon crushed it out of all shape.

The Reading railroad has heen experimenting with metal ties for ahout one year, but the officials of that company have not given any opinion as to the efficiency of this kind of tie in comparison with the old wooden ones. It is said, however, that the experiments on this line have ahout the same results, as the metal ties are hard to hold in line and fail to take proper hold of the hallast.

Scientific Progress.

The Effects of an Auroral Disturbance.

The New York *Sun* says that the remarkable auroral disturbance on July 16th produced curious phenomena on the telegraph circuits and instruments of submarine cables and aerial land lines that may afford data for scientific men in determining the actual nature and laws of the mysterious auroral phenomenon itself. In a hroad sense telegraphic circuits are affected hy auroral displays in the same manner as hy violent thunderstorms, but the precise effects from the two causes are very different. Interruptions to telegraphic communications on lines in far northern latitudes are of frequent occurrence. The lines in Canada, for instance, which run north of Lake Superior, from Montreal to Winnepeg, are at certain seasons of the year interrupted almost nightly hy slight auroral disturbances. But the disturbance on July 16th was the most remarkahle in its effects on telegraph circuits of any noted for a great many years, if not the greatest of all such displays. A prominent electrician in this city took careful note and tests of the effects of this disturbance, and he calculated that the force of the electrical current from the auroral disturhance was equal to 500 volts.

It is interesting to note, too, that the telegraph instruments showed the auroral disturbance to be very much greater during the day, from ahout 11 in the morning to 4 in the afternoon, our time, when there was no spectacular display of celestial scenic effects, than it was at night when the wonderful phenomenon was so apparent. The electrical disturhances were noted at precisely the same time in this city, in Chicago, and in Nova Scotia and Newfoundland. In Chicago it was noted that, while the sky was cloudless and the sun was shining hrightly, tremendous currents of electricity charged the air, completely interrupting all telegraphic communication. The currents came in waves at irregular intervals.

But the most interesting effects were noted on the delicate instruments of the Atlantic cables, and with these, on account of their peculiar construction, various phenomena of the auroral disturbance could be noted that were not possible on land-line instruments. With the latter the effect was simply to put a current or a ground on the circuit, which hroke things up generally and prevented all communication. On the cable instruments the length, intensity, and direction of the waves of electricity were recorded accurately. The effects were noted on the instruments of the cables that run into this city from Nova Scotia, and on the long cahles at Nova Scotia and Newfoundland, which run under the Atlantic to Ireland. It was on the long cables that the auroral effects were displayed most strongly, and as the cable drops directly from the office into the ocean, and lies at the bottom in some places three miles down, the presumption that the auroral force was exerted through that watery space, as well as on the instruments directly, is of interest.

The siphon recorder, the instrument used for submarine cable-telegraphing, is the most sensitive kind of galvanometer in practical use. The auroral disturbance interrupted communication entirely. During the disturhance, especially between the hours of 11 and 3 midday, the siphon or needle was deflected intermittently very strongly from the zero, or middle, position, and it swayed first to the right, and then to the left. The movement of the needle was very slow. It would suddenly move away to the left, pulled hy, say, a northerly current, and would be pulled very far, indeed, beyond the limit of any cable current, indicating that the current was very powerful. It would remain at the extreme point of deflection from 5 to 10 or 15 seconds, and then return slowly to zero. Sometimes immediately, sometimes a few seconds or minutes later, the needle would be pulled slowly in the other direction by a southerly current, would deflect to a remarkable distance, remain there a few seconds, and then return slowly to zero. That seemed to indicate that the electrical currents sent up hy the aurora were very powerful, were steady and of long duration, and alternated in direction of force in their polarity; they were like great waves of the ocean ebbing and flowing. The effect of a severe thunderstorm on a cable instrument, felt often when the storm is far at sea, is a quick, instantaneous jerk of the siphon, the effect lasting only an instant. The cahles were effected in the evening of the auroral display when the heavens were aglow with the magnificent streamers and hanners of light, hut the interruption was very slight as compared with that experienced during the day.

The Observations on Mars.

LICK OBSERVATORY, SAN JOSE, August 18.—Up to the middle of August many of the canals of Mars discovered in 1877 hy Prof. Schiaparelli were mapped here this year, but no one of them was seen to be double. On the night of August 17th Profs. Schaeberle, Campbell and Hussey made three entirely independent drawings, each of which show the canal marked Ganges on Schiaparelli's map to he distinctly double. Thus the Lick Observatory has the pleasure of confirming the discovery of Prof Schiaparelli in 1892, as it had already done by its observation of 1890.

The new star which appeared in the constellation Auriga last February faded to about the fifteenth magnitude, at least so as to be extremely faint in the great telescope. It was observed again last night by Profs. Schaeherle and Campbell and myself. It has increased in hrightness in a surprising manner, being now of about ten and one-half magnitude. Its appearance is not the same as other objects of the same brightness. Its spectrum was determined by Prof. Campbell, who finds the three hydrogen lines bright on a hackground of an exceedingly faint cnntinuous spectrum, nearly all the light heing condensed in the F line. The observations of the spectrum made during the last spring left many questions unsettled. The present observa ions will throw much light upon these and will enable us to trace something like a complete history of the remarkable change to which it has been subjected. E. S. HOLDEN.

A NEW SILVER-ORE.—Mr. H. N. Warren writes: The locality known as Broken Hill in Australia has to all interested in mining operations been recognized from an early period as a vast silver region, and the author has on numerous occasions had attention directed to such minerals as fahlerz, polyhasite, horn silver, etc., derived from the above locality, and which, from assays of the same, have proved themselves valuable metallurgical products. Besides these argentiferous formations, there are situated in the same locality immense argillaceous deposits, consisting for the most part of ordinary kaolin. These deposits have for years been regarded as a waste product, on account of the numerous hard particles of horny substance disseminated throughout their structure, thus rendering the materials unfit for porcelain or other manufacture. The mass of kaolin, so far as can he ascertained, thus remained untouched until the commencement of the present year, when it was again examined by some mineralogists, who, on applying a few physical tests, such as ascertaining the hardness of the particles, etc., at once became struck with their appearance and resemblaoce to horn silver, and being thus induced to proceed to practical tests, in so doing verified their supposed theory that the common kaolin deposits at once foreshadow one of the richest silver harvests yet to be gleaned. I have assayed quite recently a number of samples since the discovery of the same, and find in some the existence of silver iodide only, in others chloride only, and in further specimens the existence of chloride, hromide and iodide—the percentage of silver averaging from seven to ten per cent, with traces of gold; while in other cases samples weighing upward of 20 pounds in weight of pure chloride have heen ohtained.—Iron.

TELEPHOTOGRAPHY.— A young French chemist, M. Heri Courtonne, is credited by the Paris *Figaro* with a new discovery. Sound being transmissible by telephone, M. Courtonne argued, hy a rigorous analogy, that light might he transmitted too. As the telephone consists of a transmitter, a wire and a receiver, there was reason to believe that these three organs might be adopted for transmitting light vihrations, and for this purpose the transmitter and receiver should be prepared chemically for receiving and giving out light instead of sound vibrations. This was done hy substituting sensitized photographic plates for the ordinary telephone plate. One of the plates was placed in front of an aperture through which an image was cast, and this image has been forwarded by wire, and has been seen at the other end. The first apparatus was very imperfect, and M. Courtonne, having heard that Mr. Edison was on the track of a similar discovery, resolved to publish his experiments, a description of which he, however, sent in a sealed letter to the Academy in 1889. This letter is only to he opened at the owner's request. The *Figaro* says: "That the consequences of the telephotography cannot he overestimated. Tomorrow you will see in Paris the image of a man smoking in St. Petersburg."

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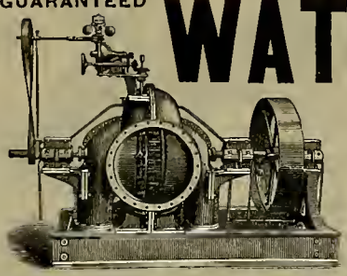

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Electricity.

Electrical Purification of Sewage.

Dr. C. A. Burghardt recently read before an English engineering society a paper on sewage and its purification. Among other processes is mentioned an electrical process. Iron is the active agent and is derived from iron plates placed in cells through which the sewage constantly flows. One set of cells is positive and the other negative. Only the positive plate is acted upon and dissolved upon its surface, hydrated ferrous oxide oeing produced hy the action of the nascent oxygen (liherated hy the decomposition of the water at this pole) acting upon the metallic iron. This hydrated ferrous oxide (which is a solution) then acts upon the organic matter, hecoming, first, hydrated ferric oxide hy ahsorption of oxygen from the air, giving up this oxygen again to the organic matter and hecoming the lower oxide, and repeating the operation for a considerahle time until the carhonaceous matters which are oxidizable have heen oxidized, when no further reduction of the ferric hydrate can take place and it remains insoluhle and suspended in the effluent, as a yellowish precipitate. In order to cause the plates to wear off or dissolve equally, the poles are reversed on alternate days, a plate heing positive on one day and negative on ano'her day.

The electrical process has heen suhmitted to a thorough trial at Weaste from Octoher, 1891, to March, 1892, on a specified quantity of 4167 gallons per hour, or 100,000 gallons per 24 hours. The current density employed was one ampere for every seven square feet of electrode surface, or 0.4 ampere hour per gallon of treated sewage. The electric shoots or channels were constructed in four lengths—the smallest numher which would be adopted in practice. Each of the four shoots is divided into 34 cells, each cell containing 16 iron plates each two feet by one foot six inches hy one-half inch. The total weight of iron plates employed in this trial was ahout 55 tons. The plates were connected all parallel in each cell, the cells in each shoot connected in series and the four shoots parallel. The electrical energy employed was 50 amperes at a pressure of 50 volts, or a little over four induced horsepower. Each of the shoots was connected hy conductors with a distrihution hoard and suitahle switches in the engine house, in order to enahle the operator to reverse the current of any one shoot when desirahle. This reversal of the current was carried out upon one shoot at a time, the other three shoots taking temporarily the whole flow of the sewage. The poles of the shoot in question heing reversed, the cells in that shoot were short-circuited, which at once caused a very rapid discharge of the hack current. After this had taken place the current was reapplied in the opposite direction through a resistance coil, and the resistance gradually cut out as the normal electrical conditions were estahlished. The treated sewage then flows into ten setting tanks (two sets of five), each tank heing eight feet wide, 16 feet long, and ahout five feet deep. The sewage flowed constantly through one or other of the sets of five tanks, and over the intermediate walls of each tank, which were provided with douhle lips in order to assist the oxidation of the effluent. It was found that the production of wet sludge was at the rate of 17.5 tons per million gallons of sewage treated. The suspended matter is principally hydrated ferric oxide, and practically free from organic matter of an ohjectionahle character. The amount of metallic iron used is ahout three grains per gallon of treated sewage, and nearly all this is present in the sludge as hydrated ferric oxide. Experiments were carried out with this sludge, hy hurning it under proper conditions, when it was found that a red oxide of iron was ohtained which could he converted into a pigment. Possihly this pigment may he so produced in a satisfactory condition and disposed of at a price which will cover the cost of production; and thus get rid of the sludge. The suspended matter was removed hy passing the settled effluent over ordinary sand filter-beds, and it was found that the filters did not become choked at all, hut retained their efficiency from Octoher, 1891, to the end of the trial in March, 1892.

Douhtless there is a future hefore this process, and American engineers would do well to investigate it thoroughly. It seems to leave little to he desired, regarded from a scientific point of view.

AN EIGHT-FOOT SPARK.—At the recent Royal Society conversazione Mr. James Wimshurst, says *Engineering*, gave another proof of his fertility of invention hy an entirely new demonstration. He had a numher of metallized surfaces nine feet long, covered with copper, tin, hrass and other metals. At each end of such a surface he placed a Leyden jar; some of the jars were coated with tin and others with brass. When the jars were charged from one of his large machines they threw out sparks over the coated surface, the color depending on the metal employed. With hrass they were a vivid green, with tin a dazzling white. At first the sparks appeared at the edges of the jar, and as they gathered strength, radiated beyond them. Gradually they hecame like adders' tongues, darting in all directions and beating themselves on the metal surface in a futile attempt to get away to earth. At length the tension rose until the electricity found itself able to fling itself over the entire distannce from jar to jar, and the magnificent spectacle of an eight-foot spark was seen.

Latest Triumph of Science.

It is difficult to convey to the lay mind an accurate comprehension of a process so exceedingly technical, says the London *Times*, hut it may hriefly he said that Mr. Langdon Davies in the "phonophore" utilizes not the electric current hut the noises caused hy induction. The signals are transmitted hy a series of induced electric impulses, and the success of the system is found in the ahility of the inductive force to pass through insulations which electric currents cannot penetrate. A wire may he hlown down and in contact with the earth, yet so long as it is not broken it will carry a phonophoric message.

By means of the phonophore messages can be transmitted with extraordinary rapidity, and there is practically no limit to the numher of telegrams that can he sent simultaneously upon the same wire. And, as we have hinted, Mr. Langdon Davies' system is as useful telephonically as it is telegraphically. A wire which is conveying electric signals can at the same time he used for telephonic conversation without either the message or the conversation suffering in the least.

Three of the principal railway companies have already adopted the phonophore, and it must be ohvious, even to the unscientific mind, that phonophoric telegraphy and telephony, in so vastly increasing the electrician's power over the wires, have before them a very great future. The phonophore, indeed, increases almost to infinity the numher of words that can he transmitted in a given time.

THOFEHRN'S ELECTROLYTIC COPPER REFINING PROCESS.—M. Hyppolyte Fontaine's work on electrolysis gives a very full account of M. Thofehrn's process for refining copper hy electrolysis. In principle the process does not differ materially from other electrolytic methods, hut the arrangement of the parts and the general working out of the details make the method, in the opinion of M. Fontaine, a new, complete and efficient system of copper refining. In the plant at present in operation there are 120 baths in 12 series of ten each. Each hath is a little lower than the next, and the siphons are placed hetween them in order to ohtain a constant circulation. After the electrolyte has left the last of each series it goes to a collecting hasin, from which it is pumped again to the distrihuting reservoir. Baths are made of concrete. They are lined first with wood, which has heen hoiled in tar, and with sheet lead. The surface of the concrete itself is protected hy a coat of a special kind of tar. The electrolyte consists of sulphate of copper, 150 parts; sulphuric acid, 60 parts, and water, 690 parts. In order to oxidize the electrolyte and so remove the impurities which are constantly forming, jets of air are introduced into the collecting hasin and the distrihuting reservoir, and at the same time the liquid is kept at a temperature of 35° C. The rate of production of refined copper is one gramme per ampere hour, or in an average of 2½ tons per day. The average drop in potential for each hath is 1.5 volt. The difference in potential at the hinding posts of the dynamo is just sufficient to overcome the resistance of the hath and the conductors. The cost of refining copper hy this installation is $19.60 per ton. The original cost of the plant was $37,300; the stock in hand has always a value of $84,000, and the annual working expenses are $9210. The interest on capital and stock and the depreciation amount to $8130 per annum; this, together with the working expenses, is equal to $17,640.

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Any stock upon which this assessment shall remain unpaid on Thursday, the 1st day of September, 1892, will he delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 26th day of September, 1892, to pay the delinquent assessment together with costs of advertising and expenses of sale.

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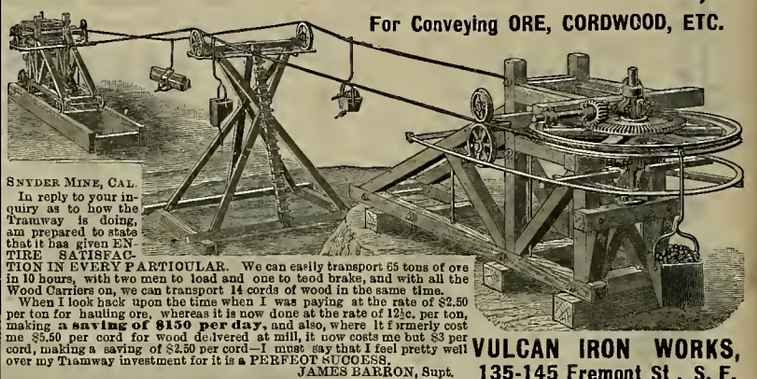

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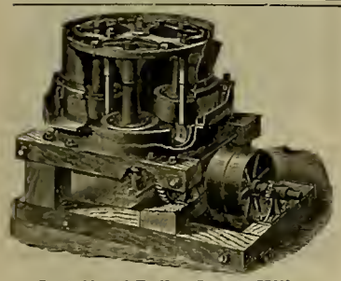

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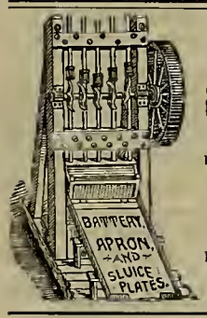

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Good Health.

Preservation of Eyesight.

We have frequently in these columns, says *Optician*, given hints and advice concerning the care and preservation of the eyesight in middle life and old age. Up to the present, however, we have not pointed out that the excessive use of tobacco not only weakens the muscles of the eye, but also produces a lowering of the acuity of vision and a form of color-blindness. In fact, among the sources of the greatest trouble to the eyesight, strange as it may appear, is the chewing of tobacco. The excessive use of wine, spirits or beer, the indiscriminate administration of quinine, the use of cosmetics for heightening the luster of the eye, and mixtures for dyeing the hair and eyebrows, may also be ranked among the destroyers of vision, and there is a case on record where a diminution of vision has been traced to the wearing of an artificial wreath of flowers.

Another source of failing vision may be traced to impeded circulation. The wearing of tight neck-covering, such as collars which are too small, or shirt-bands or neckties tightly drawn, should be avoided, as they prevent the downward column of blood returning to the heart, and dilatation and development of disease is likely to follow. The same rule holds good of constriction of other parts of the body, particularly the waist. Another most serious source of eye strain is constant reading in railway carriages, which is the practice of nearly all business-men in going to and from their offices, and the injury to the eye from this cause alone is incalculable.

Nothing gives tired eyes greater relief than a green disk or square of sufficient size suspended on a direct line of vision at or against a wall on which the eyes can rest; but best of all to look upon is a green grass plot or green trees. We advance the suggestion that it would be a public boon if our magazines were printed on paper of a neutral tint, and the drop-curtains in theaters should have scenes painted on them showing great perspective. It is a rest to the eyes after the contracted effort in trying to watch the facial expression or eyes of an actor to look upon such a picture. Many theaters have drop-curtains in which perspective is absent. The result is that no relief is given the eyes after each act, and people with the least visual defect always suffer from eye strain after spending an evening in such places of amusement.

After the last epidemic of la grippe, we were particularly impressed with the large number of people complaining of the loss of power of the converging muscles of the eye. Upon investigation, we found that while these patients were confined either to bed or home, they would read incessantly. The result of this overtaxation was weakened eye muscles, and so long as they remained unsupported by lenses the patient suffered with pain over the eye region, headaches and other evidences of eye strain. Individuals suffering from any depressing disease should be as guarded as to the length of time they read or use their eyes on straining work as they are with regard to physical exertion of any kind. Fresh air and a moderate quantity of light are great essentials to good eyesight. High temperature helps to ruin people's eyes more than is generally known, while too much light, especially if it be reflected, is particularly injurious.

The Gospel of Good Health.

When the day is over, the shadows are falling and you seek your home, how do you greet the table? Do you lean back in weary exhaustion and press your hand over and over your head? Does the music of laughter jar upon your overstrained nerves, and slight noises cause you to start in fretful impatience?

If so, you are a brain-tired man, and you need physical culture to give vigor and tone to that part of your system which is so all-important as to either make or mar you. Take plenty of exercise.

The only cure for insomnia, that deadly foe of health and beauty, is physical culture. Ask Paddy the stonemason if he is troubled with a sleepless couch after running up a 40-foot ladder for ten hours, and he will stare in astonishment at the inquiry. Then, if so, imitate Paddy and walk four miles a day, or eight, if need be, until sleep will literally haunt your pillow and refuse to be driven away.

Or, on the other hand, is your manly form becoming suspiciously stout, and you yourself plethoric, short of breath—a sort of "Pickwickian" resemblance in your face and figure? Again we emphasize "physical culture" as a certain preventive against unnecessary burdens of flesh.

Should you be called upon by some emergency to endure an unusual strain, whether of body or mind, this attention to your physical needs will then prove itself an ample compensation for any little trouble or fatigue it may have entailed upon you.

Yes, physical culture is closely connected with good health good morals and longevity. It is the best improvement of our leisure, if we are following sedentary occupations.

At any rate, William Cullen Bryant practiced it until he was past 80. Gladstone today, takes his never-failing bath and sallies out to fell trees. John Ericsson, though working 15 hours a day, walked New York streets from ten o'clock P. M. until midnight for exercise.

And since God has given us bodies which demand development, lungs which cannot live without oxygen, and minds connected with both of them by subtle and manifold ties, it is our plain duty to take the necessary steps to apply these needs of our well-being.—New York Ledger.

Useful Information.

Tests for Water.

When you wish to ascertain whether water is hard or soft take a clean tube, pour about an inch of soap solution into it, then add a few drops of water, which, if hard, will turn it milky or curdy.

If you wish to see if the water is acid or alkaline, fill a tube half full of water and dip a piece of red litimus paper into it; if the paper does not turn blue it is not alkaline. Now, dip a piece of blue litimus paper in, and if the paper does not turn red the water is not acid.

If you are looking for carbonic acid, pour into the tube about an inch of water and the same quantity of lime water; if there is carbonic acid the water becomes milky, and on adding a little hydrochloric acid will become clear again.

To see if sulphate of lime, which is known as gypsum, is present, fill a test tube with about 1½ inches of water, and a little chloride of barium; if a white precipitate is formed which will not dissolve when you add a little nitric acid, the water contains gypsum.

A test for magnesia is made as follows: Fill a test tube one-third full with the water, bring it to a boil over a spirit lamp, then add a very little carbonate of ammonia and the same amount of phosphate of soda; set it aside for some moments, and if magnesia is present it will form a white precipitate.

If the test tube is one-fourth full of water, and two drops of cochineal is added, and the water turns blue instead of pink, it will denote the presence of lead.

Copper will be shown by adding a few drops of chloride of ammonium to some water in which have been placed a few filings of soft iron. If it turns blue it is an evidence of copper. Adding one drop of ferro-cyanide of potassium to a little water in a test tube will color it blue if iron is present.

A large number of other tests, of course, are made in a thorough analysis, but these are the ones which will most interest the ordinary engineer, and can be made with the least trouble or expense.—Textile World.

The Earth's Elements.

The planet, as the storehouse of material for every construction, natural or human, yields a certain number of elements. About 64 may be accepted as the number hitherto discovered, and these certainly are all that are of any mass or quantity. Out of these for structural and working use only about one-fourth are employed either by nature or by man. Nature uses largely four gases: Oxygen, nitrogen, hydrogen, chlorine. She uses also largely two inorganic, nonmetallic bodies, carbon and sulphur. She uses one metalloid, phosphorous. Man in his work uses all these elements, with some others. Nature uses iron sparingly; man uses it largely. Nature uses the metal calcium largely, letting it enter into the construction of the bone of every skeleton of animal; man uses calcium in a rough way, in the formation of buildings, in the compound form of lime, together with other metals in the grand storehouse, tin, copper, and, lately, aluminum, substances which nature shows no preference for in any of her artistic and mechanical works. Man also uses zinc, lead and mercury, for which nature has no special employment that is obvious to us.

Man uses carbon for the same purposes as nature uses it. He employs it as fuel; so does she; but he in the crude form of coal, from which, also, he produces for other purposes different useful products artistically applicable as coloring substances, in which art, as he may one day find out, he is following some undiscovered natural design. Man uses the same elementary gases as nature does, with others that she does not employ with the same intention. Both use oxygen for sustaining combustion, but nature uses it systematically for construction, which man does not, Man uses hodrogen for combustion as nature does, but not for construction. Man takes advantage of nitrogen for concentration of energy; nature takes the same advantage, by which hydrogen, though negative, becomes the most important of vital structures; but she does more, she makes nitrogen constructive as well as concentrative, an art man has not attained.—Longman's Magazine.

LONG-DISTANCE TRANSMISSION.—The results of the famous Lauffen-Frankfort transmission of power by electricity have just been issued and show some remarkable results. The distance was 109 miles, the horsepower supplied by the dynamo ranging between 78 and 197.4 horsepower. The efficiency of the dynamo fluctuated between 84.5 and 93.5 per cent, while that of the primary transformer ranged between 93.9 and 99.1 per cent. The loss in the conductor was from 3 1 to 25 5 horsepower, the efficiency of the secondary transformer fluctuating between 92.2 and 95.7 per cent. The efficiency between the turbines and the consuming apparatus ranged from 68.5 to 74.9 per cent, being below 72 per cent in only two cases. The average result of some 17 runs with what was, after all, only an experimental plant, shows an average efficiency between the turbines and the consuming apparatus of 73.3 per cent. On a shorter transmission circuit of 1¼ miles between the Palmengarten and the Frankfort Exhibition, the average efficiency of eight runs was 83.1 per cent.

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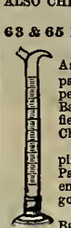

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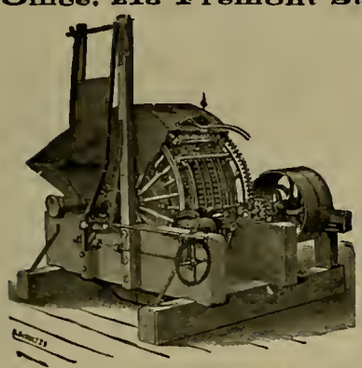

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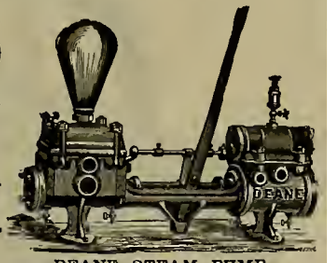

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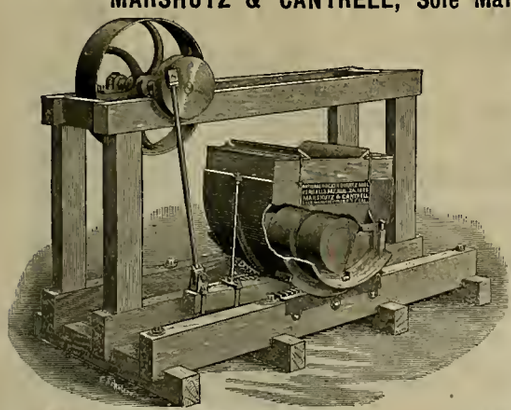

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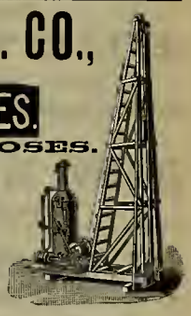

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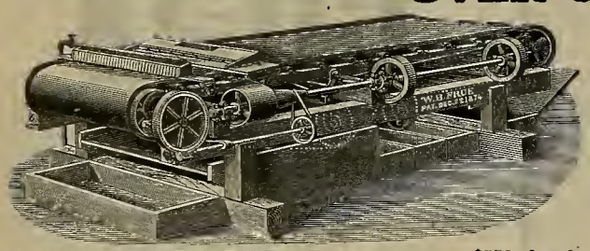

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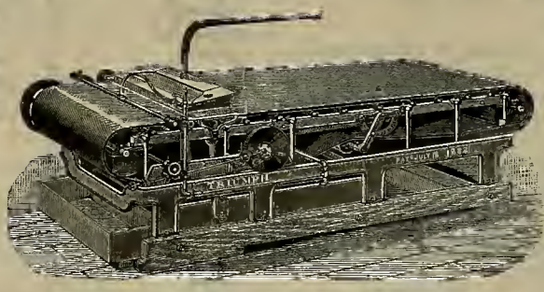

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Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,

Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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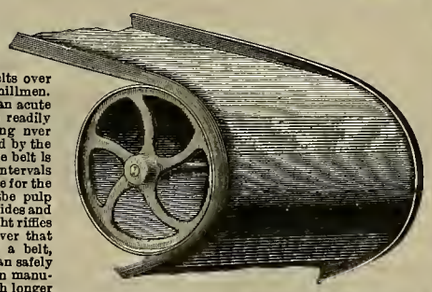

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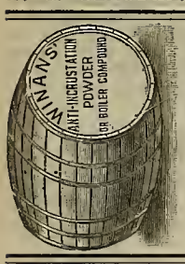
H. G. BLASDEL, Jr., Manager. 419 California St., San Francisco.



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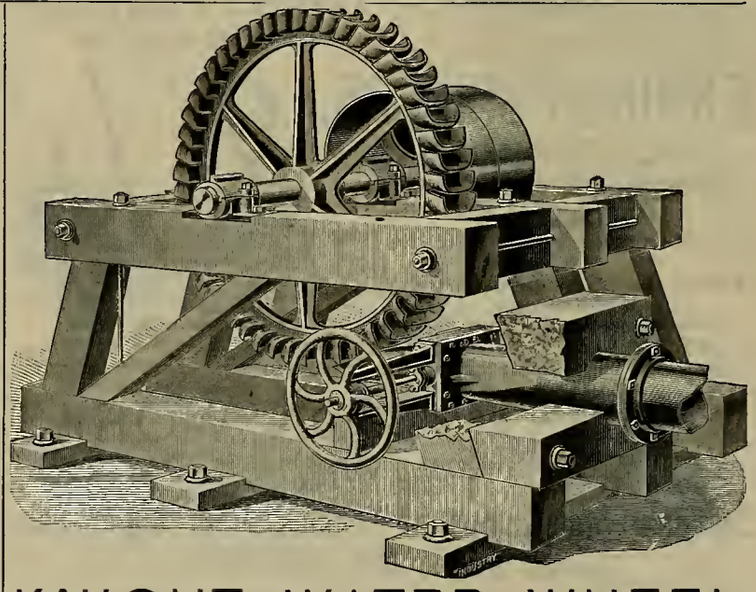

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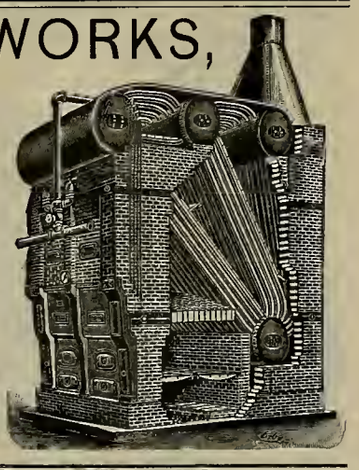

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

THE BAY STATE MINE.—*Record*, Aug. 18: The Bay State mine lies a little over three miles north from Plymouth. The present company was organized and work inaugurated there one year ago last June. A perpendicular shaft was sunk 325 feet, including the sump of 25 feet. The company is composed largely of parties in Plymouth, who have labored in the mine in order to carry the work along and keep up their assessments. The writer visited the Bay State mine last Friday and accompanied foreman Griffith down into the bowels of the earth. From the 300-foot level a drift was run east 56 feet, and it was at this point the vein was first encountered. But it soon became manifest that they were on the wrong course to follow up the ledge, and then they came back and ran north. The first indications of the vein were found after running 45 feet, when a two-inch stringer was struck. From this point the ledge continued to rapidly increase in size, until on Friday, at the face of the tunnel, a distance of 43 feet farther, it measured a large six feet between the walls. The vein is compact, and is encased on both sides with a fine gouge and walls as solid as flint. The quartz is of a ribbon character, and prospects well in free gold and sulphurets. It is the opinion of competent judges that the rock will mill from $8 to $12 a ton. There is a considerable quantity of ore on the dump, and it is the intention to soon make a test-run in one of the mills in that vicinity. A tunnel has also been run south from the shaft 122 feet, and until the last ten feet the vein has been very well defined. It is now somewhat broken up in that quarter, but there is no cause for any worry as regards that, for north from the shaft is where the company is staking its chances, and certainly the developments made there are sufficient to warrant the belief that the Bay State mine is a notable success. Fifteen men are at present employed in the mine under the superintendency of W. T. Jones. The Bay State is the only mine now working in the vicinity of Plymouth, so our readers can readily comprehend of what importance to our neighbors is the present fine outlook at that mine.

SOUTH EUREKA MINE.—*Record*, Aug. 18: C. W. Randall, A. Haleey and D. E. Hayes, large owners in the South Eureka mine, accompanied by Mr. Fowler, a mining expert, were in Sutter Creek, Saturday and Sunday last, examining the recent strike in that mine. We are credibly informed that they are well pleased with the developments, as well as with the management of the affairs of the company by Jackson Dennis and J. F. Parks. We have authentic information that the ledge is still widening and improving in quality, and as we go to press the management is highly elated over the softness of the ground in the face of the west drift, which is a very encouraging sign. What lies in this quarter, we will probably be able to state next week. A ledge on the west is looked for. A few men were laid off at the Wildman mine this week preparatory to sinking the main shaft another hundred feet. The employes at the Belmont mine were paid off last Saturday. The large ore-hin being erected at the Hector mine is nearing completion. J. A. Fanll, the well-known mining man, has been here to investigate the new developments in some of our mines.

LINCOLN.—Tributers have resumed work at the Lincoln. It is a pity that this property is in such condition that it cannot he operated in a proper manner. It is no doubt yet a good mine, but its ownership, which is divided between a Scotch company and people in this country, is in such a tangle that nothing is done. J. A. Vanderpool of Plymouth, one of the owners in the Wabash claim, which is located in the ravine at Hubbardsville, this side of Amador City, gave us a few particulars the other day concerning the progress of work over there. The tunnel is in 180 feet, and as the vein has been encountered but a short time, it is still broken up. Some rock taken out, which did not show a particle of gold, assayed $40 and $50 a ton. A blower is to be put in soon to supply air in the mine.

Butte.

RICH STRIKE.—Oroville *Register*, Aug. 18: L. C. Paxton, superintendent of the Coleman mines at Yankee Hill, has struck rich quartz, we learn, in one of the tunnels he had recently run. The machinery for a mill has been in Oroville sometime, and it is thought, now that rich ore has been found, that the mill will at once be erected.

GRAVEL RANGE.—Oroville *Register*, Aug. 11: From D. K. Perkins we obtain the following items concerning the mines in Gravel range. Thos. R. Jones & Son are working the lower or southeastern end of a paying channel. They have completed their arrangements for work this winter and put up comfortable buildings. They have the outlet for the channel and can work to good advantage as the mine is drained by the working tunnel. The channel is from 150 to 200 feet wide, and the pay dirt from three and a half to six feet thick. They are realizing good pay from the mine. Messrs. Bracken, Gregory & Doyle have run a tunnel some 600 feet, but this was too high to strike the channel, but by sinking ten feet at the face of the tunnel they reached the pay gravel and will do well. The pay dirt is about five feet in depth and prospects excellently. The Linsy Bar Company has a large number of men at work, and Mr. Wilson, the superintendent, is confident that the owners will be richly rewarded from the mine. There are many good mines in the district, but I am only speaking of those with which I am personally acquainted. In my own mine we have run a tunnel some 400 feet long and have passed three distinct pay shoots. We have taken out about 1400 tons of ore from the vein without any stoping. This ore prospects well and gives every indication that it will mill profitably. I. R. Bullard and Mr. Tolles are engaged in hanling rock to the mill on the Perkins & Gallegher mine, and two additional teams will be employed in a few days. We will crush about 1000 tons as a test of the richness of the ore in the mine.

EXTENDS IN THIS DIRECTION.—The Blue Lead channel at Bangor extends toward Oroville, and a number of miners with whom we have lately conversed are confident that it will yet be struck near this place. J. D. Braselton, three miles east of here, is certain there are indications upon his land, and he is willing to make arrangements with any one who wants to prospect for a mine. He is confident that the Blue Lead is to be found on the hill near the Grant place, and also on the Wheeler place. Will Wheeler is down 70 odd feet, and Mr. Braselton is sanguine that a rich mine will be found there.

BUTTE CREEK.—T. W. Reece returned from the forks of Butte creek on Monday, and says things are liveing up in that section. He was surveying the Morning and Evening Star gravel mines. All the miners were at work, and it was with difficulty that he could get help enough to form a surveying party. O. M. Euslow is at work surveying in the same vicinity, and it is thought that during the fall considerable prospecting will be done. A number of San Francisco parties, including Messrs. Gilleran, Morganstein and Collins, were up examining mines in which they are interested.

Calaveras.

GRAVEL AND QUARTZ. — Mokelumne Hill *Chronicle*, Aug. 20: For the past two years mining has been at a very low ebb in this vicinity. Owing to various circumstances, "capital," as it is termed, has not sought investment in this locality, which has caused the "hard times" that everybody complains of. However, we have to chronicle a great change in this respect, for we have no less than five new enterprises started since our last report and four mines running, besides the hydraulic propositions. The old Coffee Mill mine, located in Chili Gulch mining district near the base of Golden Gate mountain, is being opened under the able management of Mr. James Gleeson. This mine has been abandoned for many years, and classed as "worked out." Mr. Gleeson has provided a substantial hoisting gear propelled by steam power, and has commenced sinking a vertical shaft in the south end of the new ground above mentioned; this shaft will bottom the channel near the head of the Bob Paul drain tunnel. When tunnel and shaft are connected, a drift will be run north on the channel and connect with the old works of the Coffee Mill, which will open and drain the entire channel from its inlet in Poorman's gulch, head of the Kremer mine, to mouth of tunnel in Bob Paul mine, a distance of 2½ miles. The old Blue Lead, located in Chili Gulch near the Junction postoffice, is again to be opened by Mr. Edward Rigney. He has a force of men at present engaged in sinking a shaft. F. J. Horswill, Esq., has assumed management of the What Cheer mine and intends sinking the shaft deeper, which will insure this property being a dividend proposition. Mr. Horswill has got control of the property, has refitted the machinery, pumped out the mine, and will at once put in power drills, sink the working shaft to a proper depth and open and work the mine profitably. We expect to soon chronicle the event of the clatter of stamps at the old What Cheer mill. Quartz prospecting is assuming healthy proportions at present. Mr. Kreeling, of the Sandy Bar Co., has bonded the Linderaxa mine, located on the Mokelumne river slope, about two miles northeast of town, which property is owned by Messrs. Tynan and Vandel. The owners had the property opened by short tunnels on the vein, and had mill tests of the property by crushing of rock packed to the Sandy Bar mill, one mile distant. These tests were satisfactory, in consequence of which the Sandy Bar Company secured control (under bond) of the claim and are engaged driving drifts and sinking shafts on the different ore bodies under the management of their superintendent, Chas. E. Crowell, Esq. This lead is a well-defined, strong fissure vein from 5 to 15 feet wide, and all indications are strong for a paying property. Work in all places has thus far developed rock satisfactory to Mr. Crowell, and the erection of a mill in the near future would be no surprise to the writer. The Mokelumne, or formerly known Leavitt mine, is a parallel lead to the Linderaxa, located about three-quarters of a mile west and is owned and operated by Joseph Davis, Esq., of San Francisco. The old veteran, Capt. Elzy, has charge of the work of development, which, of course, is going along smoothly. The necessary development work is here being done to insure the erection of a mill. A tunnel on the vein has been run through the mountain a distance of 750 feet, developing a 3½-foot vein of $6 to $7 rock. A small Huntington mill on the property has been used for testing the rock, with above results. Now a force of men is engaged in running a tunnel from the Mokelumne river level to tap the lead at the greatest possible depth. Of the mines that are working, we are pleased to state that the Quaker Mining Co. have succeeded in getting their shaft down nearly 600 feet, and are now engaged in crosscutting for the lead. The River mine, owned by Messrs. Petre & Tripp, located at the Big Bar bridge, is running in full blast. Their ten-stamp mill is engaged in crushing rock that is paying about $7 per ton. As they have a lead from 5 to 15 feet in width, it is considered high-grade rock. The rock is milled and mined at about $1 per ton. We are now credibly informed that the pay has been found on the opposite side of the lead, and that the mine shows up to be a more valuable property at present than when Mr. Petre paid $15,000 in hard cash for a one-third interest in the same. The Democrat mine, located at the head of Chili gulch, is running along as usual. The owners, Messrs. Pellston, Pfeiffer, Fisher and Wait, all four young men of our town, have erected a three-steam mill, do their own work and keep the mill bumping away on gravel that of course pays. The Horswill gravel mine, located on Stockton ridge, on ground adjoining the old Concentrator or Burleson mine on the south, is opened by an incline shaft 650 feet long on a grade of one foot in three. Gravel has been encountered, and drifting in channel is now being prosecuted. The gravel, being cemented, will not wash, but sufficient gold is being saved in the dump-box washings to warrant the further working of the mine and construction of machinery for reducing the pay gravel. Altogether the mining outlook is most encouraging. We can already notice the changed appearance of our merchants, and it is pleasing to note that we have not an idle man in town.

Los Angeles.

GLEASON MOUNTAIN CAMP.—Los Angeles *Express*, Aug. 11: Thomas Kelly, a well-known mining man, arrived in the city yesterday direct from his extensive interests on Gleason mountain, in the northern part of this county. Mr. Kelly is the owner of two of the most promising free-milling gold quartz propositions in southern California—the Padre and Bay State claims, located on the southeastern slope of the mountain, and distant about nine miles northeast of Acton station, on the Southern Pacific railway. These properties were originally located by Mr. Kelly, and ever since he has vigorously carried forward their systematic development. In conversation with the gentleman, an *Express* representative was given some interesting facts concerning at once those properties and the rapidly-growing district of Gleason mountain. Said Mr. Kelly: "I am consummating negotiations for a complete machinery plant for the Padre and Bay State mines, which I hope to arrange, shall be operated as a consolidated proposition. I propose to put up a ten-stamp mill, with all incidental equipment, and so arranged as to admit of the enlargement of the mill to 20 or 40 stamps if necessary, at comparatively slight additional cost. We have ore enough on the dumps at both mines to keep such a mill going at least for half a year, and meantime we could make the mines steadily productive. Our mill, in operation, will be the largest and most complete in southern California. Col. W. W. Hollister and banker Beckmann, of Santa Barbara, are interested with me, and I go to that city today to complete arrangements for ordering the machinery. Things in the district are looming up lustily. On the John Robarts mine a five-stamp mill will be immediately put up. Mr. Robarts having some time ago contracted for it. Another mill will go up shortly on an adjoining property, and, all working, there will be 20 stamps pounding away every hour in the day and night—quite a nucleus for a camp really not yet two years old, as far as the work of development of the prospects there is concerned. In and about the district are several hundred prospectors, and hardly a day passes that we don't hear of some important discovery. The district is an essentially free-milling gold quartz producer, and striking an average from most of the responsible assays made of gold ore from Gleason mountain, I find that $12.50 per ton is a safe estimate. This is a splendid showing for a district of the size of this. Yes, all that country up there is directly tributary to this city, and our angelic merchants want at once to keep an eye on its development and lend those prosecuting the work a helping hand. I have just left a party who owns a prospect on the mountain, who showed me a return in money of $492 for gold shipped as the result of a 12-day run with a little Mahoney pony mill of one stamp."

FRAZER MOUNTAIN MINES.—Lancaster *Gazette*, Aug. 11: In a brief review with Col. T. W. Brooks of Pomona, a mine expert of many years' experience, having examined the Frazer mining district, the *Gazette* man gleaned some facts as to the condition of the mines near Gorman station. Mr. Brooks stated that he had visited all of the important mines and mills of Frazer mountain, and, judging from the general appearance of the character and quantity of the ore, the accessibility and the special advantage of operating upon the ground, he knows no reason why, with judicious management and proper application for extracting the metal, it should not be a dividend-paying camp. The advantages from timber, water, climate, good roads, etc, are very great. At the old Frazer mine, now owned by Messrs. Spence, Bicknell, Crank and others of Los Angeles, and superintended by George Gleason, there is a grand opportunity for deep horizontal tunneling. Their ten-stamp mill will very soon be in readiness to run upon their dumps of ore, of which they have hundreds of tons of rich ore. Upon the western slope of Frazer, Mr. Brooks met Isaac Haylock, the district recorder, who, in company with his brother, showed him samples of very high-grade free-gold rock taken from different mines owned by the brothers. To the south and west of this camp, Sunnyview, he examined the White Mule mine owned by J. A. Hezlett and partner of Compton. The property is being superintended by Mr. Hazlett, who is working hard and prudently. The incline and horizontal shafts, to the depths of 100 feet, have exposed a well-defined body of gold rock. This property, like others situated upon Frazer mountain, is very advantageously situated for cheap and rapid working. The foundation for a new five-stamp having been prepared, and an expensive road built to the site, preparatory to hauling machinery on the ground, at an early date the mill is to be erected and started to work on the ore. To the south, southeast and southwest side of the mountain, work has been done in many places, showing a similar class of ore to that seen elsewhere. Mr. Brooks is very favorably impressed with the locality of the Castiac mine and mill, and was informed that it is successfully running on free-gold rock. He did not visit the mines of Captain J. H. Kolle and J. Hayes on this side of Gorman station. They have tunnels exposing gold rock for several hundred feet. The assays of the ore from this mine of Kolle & Hayes prove it to be very rich. The line of proposed railroad runs near their mines, and when that is built they expect to have some lively times there. Mr. Brooks was highly impressed with the accommodating and neighborly class of people around Gorman station. Frazer mountain reaches an altitude of 8600 feet, is comparatively oval in shape and has a great abundance of pine for fuel on the lower land and fine saw timber on the higher part of the mountain. It is surrounded with fertile valley, stock and hay ranches.

Mono.

THE BODIE CON.—*Miner*, Aug. 16: During the past week east crosscut No. 1, 700-foot level, was extended 18 feet. Upraise from No. 2 south drift, 700-foot level, was extended 13 feet. North drift, 70 feet above the 700-foot level, was extended 15 feet. East crosscut No. 1, 550-foot level, was extended 8 feet. South drift from upraise above 400-foot level was extended 5 feet.

THE MONO.—During the past week west crosscut No. 3, 700-foot level, was extended 8 feet. East crosscut No. 3, same level, was extended 6 feet. West crosscut from top of No. 1 upraise, 600-foot level, was extended 14 feet.

Orange.

SANTIAGO MINES.—*Herald*, Aug. 16: An ore-crusher and concentrator has been purchased by the Santiago Silver Mining Company and is being set up at the mines above Modjeska's ranch. With the completion of a big smelter in Los Angeles, work will doubtless be pushed on a number of Santiago mines at a good profit.

Plumas.

PORT WINE.—*Plumas Co. Bulletin*, Aug. 19: G. W. Caya, of Port Wine, made us a visit Saturday. The Happy Hollow drift mine is supposed to be nearly worked out. The company has about 30 men employed. On the same channel, about half a mile above the Happy Hollow mine, Mr. Caya's brother-in-law is opening up an important drift mine. He employs about 30 men and the mine is producing well. The prospects indicate that when fully opened this property will yield large results.

THISTLE SHAFT.—At Thistle shaft work is progressing successfully, though owing to a scarcity of water, the force of men is comparatively small. It is understood that considerable gold is being taken from the mine. This company owns several miles of the channel on which its works are located, and certainly has one of the best drift mines in the State. Of necessity, the expenses are large, thus causing much money to be scattered in that section.

GOOD RESULTS.—James Megown was down from his mine near Spanish Ranch early in the week. He lately finished some ground-sluicing on the surface of his quartz ledge, and as a result of 24 days' labor he cleaned up nearly $500. He has a good ledge of quartz, but is unable to erect a mill and otherwise improve the property. He is a man 70 years of age and feels unequal to such a task. Here is a chance for a company to purchase and develop a good property.

COPPER MINES.—The prospect of a railroad through Plumas is attracting considerable attention to the various resources of the county, especially timber and mineral. Among the mineral resources are the copper mines of Light's canyon and those in Gennesee valley. The Eagle mine, in Light's canyon, is a large deposit of copper ore of high grade, which, with good transportation facilities, such as the new railroad will furnish, would yield to operators of it handsome returns and be the means of scattering a great deal of money in the county. The same is true of the copper mines in Genesee valley. We understand that Col. Root, who was here last week, has just secured a bond on the Reward mine in Genesee valley, and he expects to interest capital in them.

GOOD PROSPECT.—Chas. Trybom, who was in town Monday, has been industriously at work on the Honeycomb quartz ledge, which is located on Eagle gulch, near the Toll Gate. He recently cut through the hanging wall and into the quartz vein. The ore body at this point is about three feet wide and prospects from $15 to $20 per ton, so Mr. Trybom claims. He showed us some very nice specimens of ore rich in gold.

Shasta.

NOTES.—Redding *Free Press*, Aug. 13: Jim Eligh and Dr. Geo. Grotefend, owners of the Banghart mine at Whiskytown, are doing quite well with the property. The Sunny Hill mines, owned by Bell Bros., will be turned over to a San Francisco company this week. It is rumored that the selling price is $50,000. Peter Sherer is negotiating for the sale of his 290 acres of land and 11 mines, including the Eureka tellurium and the Cleveland. From this latter claim he is getting some fine rock, assaying $80 to the ton. Weil & Conroy have shut down the Morton & Blis mine on Squaw creek. In conversation with Mr. Weil, he expressed great confidence in the mine and the richness of the ore, but said that the mill and apparatus to save the gold was not perfect, and that under the circumstances he did not feel justified in going to the expense necessary to make the proposition a paying one. The lead discoveries near Round mountain are creating considerable talk. The ledges show up strong and the ore assays well. These, with the coal

deposits of the locality, will make things lively ere long. Cooper & Co., the owners of certain coal lands, can, at the present time, sell out for a large figure, and the coal is called first-class by the experts sent to examine it. Jewett Scranton, superintendent for Bell Bros., brought in three sacks of fine lead ore last Wednesday evening. D. R. C. Brown, of Aspen, Colorado, the purchaser of 13 claims from R. E. Moore and Jack Strode of Whiskytown, has recently had his claims surveyed by Sam Brackins. Sam says that he surveyed one of the prettiest ledges he ever saw, rich in free gold and sulphurets. It lies vertical and straight as an arrow and is about four feet wide. The rock prospects ten cents to the pan in rusty gold. Several men are employed in developing a ledge located on Dog creek.

Trinity.

NEW RIVER.—Trinity *Journal*, Aug. 19: F. J. Ladd is getting a lot of timber on the Tough Nut mine, preparatory to starting operations. That mine has always paid well, and considerable bullion has been taken out of it. Mr. Boyd has a placer mine on Emigrant gulch where he has been sluicing all the spring and summer, and is now cleaning up. He picked up a nugget at the head of his ground sluice weighing one ounce. He expects a good cleanup.

NEVADA.

Washoe District.

CON. CAL. & VA. MINE.—Virginia *Chronicle*, Aug. 20: 1100 level—The west crosscut from the main north lateral drift, 315 feet north from the shaft station, has been advanced 30 feet; total length, 50 feet; in a porphyry and clay formation. 1500 level—From the south drift at point of connection with the old stopes we continue to extract some ore and fillings of average milling value. 1800 level—Along the south end of the drift running south from the crosscut run east from the winze No. 1, sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. There has been extracted from all parts of the mine during the week 992 180-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $25.67 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $22.34 per ton, per battery samples. Bullion shipped to Carson Mint, assay value, $31,649.96.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, at a point 42 feet in from its mouth, a west crosscut No. 2 was started and has been advanced 16 feet in porphyry and quartz, carrying a low assay value.

MEXICAN.—On the 1465 level the drift running north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south boundary of the mine, at a point 40 feet east from the winze, has been advanced six feet; total length, 230 feet. From this north drift, at a point 209 feet in from its mouth, a west crosscut was started and has been advanced 12 feet, in porphyry and clay.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 23 feet; total length west from the joint shaft, 2323 feet. The face is in clay and porphyry.

UTAH.—340 level—From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 25 feet; total length, 197 feet; continuing in porphyry, clay and quartz of low assay value.

SIERRA NEVADA.— The east crosscut No. 2, started 200 feet south of east crosscut No. 1, has been advanced 40 feet; total length, 146 feet; face in hard porphyry. The joint Sierra Nevada and Union west drift, 900 level, has been advanced 23 feet during the week; total distance west of shaft, 2323 feet; face in clay and porphyry.

ANDES.—East crosscut No. 1, north on 420 level, advanced 19 feet; total length, 74 feet; formation quartz.

GOULD & CURRY.—200 level: During the past week we have extracted 75 cars of ore from the old stopes on the 200 and 400 levels, the average car sample of which is $15.23 per ton. Shipped to the Occidental mill 114 tons; milled 105 tons; battery assay, $18.48. On the Sutro tunnel level the joint north drift with the Savage Company has been advanced 22 feet; total length, 520 feet. We are still easing timbers in the joint upraise.

BEST & BELCHER.—900 level: During the past week the north drift from east crosscut No. 1, 100 feet from switch, has been extended 18 feet; face in porphyry and stringers of quartz; total length, 88 feet.

HALE & NORCROSS.—We continne retimhering main shaft above 1100 level. Main Incline—Are making the necessary repairs. 1800 level: During the week advanced the north drift 25 feet; total length, 115 feet. The south drift on this level was advanced 10 feet; total length, 95 feet. The faces of these drifts are still being continued outside and east of the ledge.

CHOLLAR—Are repairing the raise from the 450 to the 500 level. Are repairing north drift, 750 level. The east crosscut, 160 feet south of north line, 920 level, is in 25 feet; face in porphyry and streaks of quartz.

POTOSI.—North drift, 120 feet east of Potosi winze, 1100 level, is out 24 feet; there are three feet of $20 quartz in the face. South drift from east crosscut, 40 feet north of Potosi winze, 1140 level, is in 20 feet; face in low-grade quartz. Potosi winze is down 471 feet below the 1500 level; bottom in quartz and porphyry. The northwest drift from the 1800 station, Ward shaft, has a total length of 740 feet; face in hard porphyry. Extracted and sent to the mill during the past week 431 1600-2000 tons of ore from the 930, 1100, 1150 and 1300 levels. Milled during the week 432 tons. On hand at mill, 76 200-2000 tone; average battery assay, $24.36; average car samnle assays, $25.21. Shipped to the Carson Mint 410 pounds of crude bullion.

WAAN COMBINATION SHAFT.—The joint Alpha and Exchequer south drift from the north line of Exchequer, 1800 level of Ward shaft, has a total length of 398 feet; face in porphyry. The joint Bullion and Potosi northwest drift from the 1800 station has a total length of 740 feet; face in hard porphyry.

ARIZONA.

THE TOMASTONE M. AND M. CO.—Tombstone *Prospector*, Aug. 11: The total expenditures of the Tombstone Mill and Mining Co. for the year ending June 30, 1892, are $396,405.90. The output from the mines worked by the company, viz., Lucky Cuss, West Side, Northwest, Toughnut, Assay Office and Charleston, aggregate 7,027.82 tons, and the yield in ounces therefrom was 460,505.74 silver and 4,207.80 ounces gold. The production of ore has exceeded that of the previous year by 2956 tons. The average grade has increased 3.90 ounces per ton in silver and declined 26 ounces per ton in gold, making the average value of the ore per ton in these metals nearly the same in two years. The percentage of lead has been nearly stationary. The increased production has come mainly from the Northwest and Tonghnut mines, hut all the mines have improved in this respect over the previous year. A very large amount of new gronnd has been opened in the mines during the year by new drifts, crosscuts, winzes and raises, aggregating 12,354 lineal feet, or 54 per cent more than the preceding year. The total number of cars of rock of all kinds hoisted was 81,515, which, together with 2182 tanks of water hoisted from the Lucky Cuss mine, amounted to 54,730 tons. Of these, only 6705 tons, or 12.4 per cent, was shipping grade and was sent to the smelter. The machinery at the different mines has been kept in good condition, and we are fortunate in being able to repeat the statement made in the last report that there have been no accidents of a serione nature during the year. 147 men are employed at present, 139 at Tombstone and eight at Charleston. Those employed directly at the mines are divided between them as follows: Lucky Cuss, 44; West Side (sulphuret), 34; Northwest, 32; Tonghnut, 33. In regard to occupation they are divided as follows: Foremen, 3; miners, 86: engineers, 7; topmen, 4; carmen, 15; ore sorters, 9; blacksmiths, 4; timber men, 3; diamond drill, 2; office, assay office and stable, 6.

OREGON.

NEW MILL.—Ashland *Tidings*, Aug. 19: The latest news from the Caven quartz mine in Siskiyou county, in which Messrs. Mullen, Kingsbury and Walters of Ashland, and Spencer of Portland, are interested, is that the mine is one of the richest now opening in this part of the country. The 10-stamp mill which was ready for business last week made a trial run of 12 hours last Saturday, and the resnlt was a cleanup of more than $100. The mill was to be started for regular work last Wednesday, and good returns are looked for. A permanent ledge five feet wide has been tapped at a depth of 60 feet in the shaft, and it improves with depth.

WASHINGTON.

THE MONTE CRISTO MINES.—Cor. Seattle *Post-Intelligencer*, Aug. 11: The Monte Cristo Mining Company's mill is now in snccessful operation and began its regular cut to-day. Its capacity is 10,000 feet per day and a heavy supply of timber is immediately at hand. The greatest difficulty was experienced in transporting the mill machinery to this point. It was shipped by water up the Skagit to Sauk City, and from there hanled by ox teams over hard mountain roade to Monte Cristo. The first cut of lnmber will be for the new hoarding-house and afterward the timbers for the concentrator. The company will at once begin the erection of a large hoarding-house for the accommodation of an increased force. Provision will be made for 100 or more men, the gangs on the upper mines having cahins in close proximity to work. Contracts for the big concentrator to be built at this point are being let and work will hegin shortly. The location determined upon is on Glacier creek, a short distance above the junction of Glacier and '75 creeks. Work will be pushed rapiöly in order that the mill may be completed hefore enow interferes. F. W. Wilmans, president of the Wilmans' Mining Company of Seattle, arrived yesterday to arrange for the opening of several more of the company's properties. Work is heing prosecnted on three promising locations, the Hopeful, Comet, and Monte Cristo. Mr. Wilmans will be engaged here for a week or more. Parsons, representing the California Wire Works (Hallidie's Company) of San Francisco, was on the ground a few days ago, fignring on the extensive tram system which is to he huilt to bring the ore from the various mines to the concentrator. A numher of miles of tramways will be reqnired.

DEVELOPING RICH PROSPECTS.— Okanogan *Outlook*, Aug. 11: That portion of the Palmer mountain district, of which the city of Golden is the commercial center, has heen the scene of great activity in the way of mining development for the last six months, and the indications are that within the next eix months this section will witness fully as much advancement as any other portion of the gold-producing districts of Okanogan county. Five months ago Golden was a log cabin village of not more than a dozen inhabitants, and hut little attention was paid to the mining interests outside of the few prospects on which the owners were able to do sometbing more than the law requires. There are two mills, with a capacity of 25 tons a day each, in successful operation and the machinery for another of the same size has been purchased and is now in transit, all of which are to he located within a radius of two miles from the town of Golden. From a deserted, prospectors' camp, comprised of ahout a dozen log cahins, a thriving little town has sprung up, as if by magic. and the Golden of to-day has a popnlation of ahont 200 inhabitants. Golden is on the eastern slope of Palmer mountain, 14 miles northeast of Loomiston and six miles southwest of Oro, the new town on the Similikameen. Tributary to it are some of the most promising gold claims in the Palmer monntain district, including such noted p operties as the Rainhow grono, the Triune and Jessie group, the Spokane, John Sherman, Richmond, the Wehe gronp and dozens of other claims of greater or less merit. The hills are full of prospectors, either looking for new discoveries or doing development work on old ones. Ths Wanicut Lake M. & M. Co., under the able and energetic management of Joseph Hanauer, has heen the principle factor in hringing this section to the front, and the successful operation of their mill has had the effect of stimulating developmeut work all around them, and also of inducing others to investigate and invest in properties that heretofore have attracted little or no attention. The company is now the sole owner of the Spokane mine. From this property it has heen getting its supply of ore for the mill. The ore is free-milling and averages from $8 to $20 a ton in gold.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING AUG. 16, 1892.

480,703.—DRESS FORM—H. Baer, S. F.

480,761. — ORE-CRUSHING MACHINE — E. H. Booth, S F.

480,998. — PREVENTING R. R. RAILS FROM SPREADING—J. H. Burns, Spokane, Wash.

481,013.—SLIDE VALVE—A. T. Doyle, Pendleton, Or.

481,020. — SNATCH BLOCK — A. C. French, Seattle, Wash.

481,022. — PUMP — M. M. Grove, Garfield, Wash.

481,031.— AMALGAMATING SILVER ORE — A. Janin, S. F.

481,032.—RAILWAY RAIL CHAIR—B. Jennings, San Jose, Cal.

481,035.—MUSICAL INSTRUMENT—D. Kempton, Summerland, Cal.

481,145.—SASH BALANCE—J. P. Magney, Oakland, Cal.

480,876.— CATAMENIAL APPLIANCE — W. H. Masser, Los Angeles, Cal.

480,824 —LUMBER ELEVATOR—H. McKinnon, Eureka, Cal.

481,042.—ELECTRIC TRAIN SIGNAL—Geo. Merritt, S. F.

481,043.—PUMP—E. D. Middlekauff, Stockton, Cal.

481,055.—SIDE REFLECTOR—C. E. Plumtree, Spokane, Wash.

481,061.—FERMENTING PROCESS—F. W. Rueff, S. F.

481,078.—GATE—C. Talbot, Santa Rosa, Cal.

The following brief list by telegraph, for Aug. 23, will appear more complete on receipt of mail advices:

California—George A. Adams, Santa Clara, boring and mortising machine; William S. Cranmer, Sonoma, bicycle; John Ells, Stockton, combined vise, pipe tongs and cutter; Jacob P. Engle, San Francisco, two patents, one to recover the waste products of petroleum and the other to separate the waste products of petroleum distillation; John McKellar, San Francisco, steam trap; Alexander J. Robberson, Napa, pillow-sham holder; Willlam W. Slater and H. C. Barnes, Oakland, pneumatic electric circuit controlling and interlocking apparatus; John T. Smith, San Francisco, oil-cup; Axel Warenskjold, San Diego, nut lock; James Winslow, San Francisco, roofing and siding.

Oregon—Silas P. Lowel, Eugene, washing machine.

Washington — Robert Moran, Seattle, hydraulic lifting dock.

Nevada—Arthur B. Shearer, Reno, life-saving and pleasure craft.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained throngh Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ELECTRIC TRAIN-SIGNAL.—George Merritt, S. F. No. 481,042. Dated Aug. 16, 1892. This is one of that class of train-signals in which a signal or alarm bell is placed upon the locomotive and is operated by means of an electric circuit extending throngh the train of cars, and adapted to he opened and closed to actnate and stop the hell. The object of the invention is to provide a simple and effective train-signal which can be readily operated from or hetween any of the cars of the train and from any position in said cars, and which will operate npon the breaking apart of the train.

FERMENTING PROCESS.— Frederick R. Rueff, S. F. No. 481,061. Dated Ang. 16, 1892. In the ordinary fermenting apparatns nsed in the manufactnre of champagne, in which the fermenting germs are kept in a separate vessel, there is no provision made for removing the vessel containing the liquid heing fermented, nor is it possihle to remove the germs themselves, conseqnently the fermentation cannot be interrupted at any desired point, hut must be continued to completeness, and it ie necessary therefore to add more sugar to the liqnid being hottled. By Mr. Rueff's method, he claims to he able to arrest the fermentation at such a point as to preserve some of the original sugar, so that no more need be added. He is further enabled to draw off the fermenting germs at any time without stopping the fermentation. In the ordinary process, on account of not being able to stop the fermentation at a given point, the products are unequal in alcohol, sugar and carbonic acid, and some of the fermenting germs find their way into the hottles even with the most careful filtering. By continuous use the yeast becomes decomposed and no opportunity is afforded of drawing it off to clean the vessels. By the process patented hy Mr. Rueff, he is enahled to carry out a continuous operation; to remove the old germs of used yeast without interrupting the fermentation in the hottles; to stop the fermentation at any desired point without emptying the vessels; to produce products always equal in alcohol, sugar and carhonic acid, and to ohtain a clear liquid after a time of rest and cooling.

GATE.—Coleman Talhot, Santa Rosa, assignor of one-half to J. M. Talhot. No. 481,078. Dated Aug. 16, 1892. This is one of that class of gates pivoted horizontally at one end, whereby they swing in a vertical arc to open and close, heing actuated by suitable operating ropes, assisted by counter-halance weight. The object of the invention is to provide a simple and easily operated gate which can be opened and closed by the traveler without having to alight from his vehicle.

RAILWAY RAIL CHAIR.— Byron Jennings, San Jose, assignor of one-half to James Brusie, Oakland. No. 481,032. Dated Angust 16, 1892. The object of this invention is to provide a chair, which is fixed to the cross-ties of a railway, for the pnrpose of supporting the rail at a snitable height above the tie to allow the proper filling and paving hetween the rails and above the snrface of the ties; and the improvement consists essentially in the novel means of securing the raile to these chairs. The rail will he free to contract or elongate by changes of temperature without loosening the clamp or its key, as these parts are all locked upon the chair, while the projecting head has sufficient pressure upon the rail flange to hold it securely in place.

QUARTZ CRUSHER.—A. P. Anderson, Oriental, Esmeralda Co., Nev. No. 480,647. Dated Aug. 9, 1892. This invention consists of a short cylindrical drum having a central rib or flange and screws at the ends. Within this drum are heavy rollers, one of which is fitted upon each side of the central rih, and they are connected together by a tapering shaft passing throngh their centers and secured therein. The rih serves as a guide to keep the rollers in place as the drum rotates. Both the interior surface of the drnm and the exterior surfaces of the rollers have removahle shoes to receive the wear and the ore is discharged through the screens at the ends as fast as it is crushed fine enough. The drum is supported upon two horizontal rollers properly journaled, and power is applied to rotate the drum hy a belt passing around it from any driving pulley. The ore is fed into the ends of the drum through pipes leading from a hopper above into the center of the ends of the drum.

New Incorporations.

The following companies have heen incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

FORTIN BRICK CO. (Oakland). Capital stock, $240,000. Directors, V. L. Fortin, D. E. Fortin, P. Fortin, J. J. North and D. W. La Fortune.

PALERMO HOTEL CO. Capital stock, $25,000. Object, to huild a hotel at Palermo, Butte Co. Directors, C. W. McAfee, B. R. Taylor, Henry Wise, Joseph R. Folsom and C. O. Hayes.

COLUMBIAN PLUME CO. Capital stock, $25,500. Object, to deal in pampas plumes. Directors, Geo. T. Hawley, W. H. Bailey, W. E. Hale, Mrs. Harriet W. R. Strong, W. H. Chickering.

FIBRE CONCENTRATOR CO. Capital stock, $100,000. Directors, F. P. Bull, F. C. Cleary, C. C. Leavitt, L. M. Howe and W. H. Sigourney.

SIERRA IRRIGATION AND LUMBER CO. Location, Fresno Co. Capital stock, $3,000,000. Directors, Chas. L. Morrill, Albert Brown, L. J. Miller, B. F. Ellis and John Barten.

BODIE AND HAWTHORNE TELEPHONE AND TELEGRAPH CO., of Bodie, Mono Co. Capital stock, $3500. Directors, J. S. Cain, Thos. H. Leggett, John W. Kelly, N. W. Boyd, J. F. Parr, A. Graham and D. N. Carrington.

BLUE HILL MINING CO., Nevada Co. Capital stock, $150 000. Directors, W. F. Englebright, J. C. Rich, Geo. E. Turner, C. E. Mulloy and John A. Rapp.

WULFF'S MANUFACTURING CO. Capital stock, $5000. Object, to manufacture and sell mnstard, pickles, sauerkraut and other condiments. Directors, P. Wnlff, J. F. Schomer, W. D. Meyer, Henry A. von der Nienburg, John Knubel, John N. Meyer, Henry Schulken.

SUMMIT LAKE CANAL CO. Capital stock, $5,000,000. To do business in Fresno, Merced and Stanislaus connties Directors, T. J. Parsons, A. W. Robinson, E. P. Raun, George A. Knight, I. W. Ross, D. R. McIntosh and Wm. Strader.

SOUTHERN HEIGHTS AND VISITACION RAILWAY CO. Capital stock, $1,000,000 in 10,000 shares. Directors, Chas. T. Crocker, H. E. Huntington, F. S. Douty, N. T. Smith and J. L. Wilcutt. The new road is to he a single or double-track street road, to be operated by all or any means known or yet to be discovered. The line desired to he followed commences at the intersection of Mission and Sixth streets, to Brannan, to Eighth, across Townsend and Channel, to Kansas, to Santa Clara, to Connecticut, to Solano, to Kentucky, to and across Tnlare, Islais creek channel and Islaie street, to Railroad avenue, thence along Railroad avenne to the southerly end thereof. Also commencing

at the intersection of Kentucky and Solano streets, along Kentucky to Fourth, to King. The combined length of the railroads is estimated at eight miles. This incorporation covers a franchise granted several months ago to Abner Doble. I. C. Stump and others, who at once commenced the work of grading at several points over which the proposed road passes. There was an understanding, however, with the Southern Pacific Company from the first that construction should be done by that corporation, and the incorporation is in accordance with that agreement. A large force of men will be put to work at once, and construction will be hurried to completion at the earliest possible date. The Southern Pacific Company will, of course, own and operate the new line.

REED MINING AND MILLING CO. Capital stock, $2,000,000. Directors—M. J. McDonald, J. H. Isham, E. D. Rue, M. A. Jackson and C. E. Anderson.

PACIFIC CONSTRUCTION CO. Capital stock, $250,000. Directors—J. P. McCormick, W. F. Kearns, T. J. McCormick, A. J. Meadows and J. H. Perry.

PLACER COUNTY LAND AND IMPROVEMENT CO., Newcastle, Placer county. Capital stock, $100,000. Directors—A. H Schnabel, J. D. Matthew, E. B. Silva, F. J Mason and A. H. Schnabel.

GIANT POWDER CO. CONSOLIDATED. Capital stock, $5,000,000. Object, to manufacture, purchase, use and deal in dynamite and other explosives in this city and county Directors—Albert Dibblee, E. M. Root, James B. Stetson, Henry Epstein, L. P. Drexler, E. B Pond and Gustav Sutro.

HORSESHOE MINING CO. of Grass Valley district. Directors—J. R. Cooley, J. W. Rumsey, Geo. T. Tracy, John E. Cooley and Geo. E. Riley. The mine is located on Wolf creek, in the vicinity of the Omaha, Nevada county, and a considerable amount of work has been done on it in sinking a shaft.

TRINITY RIVER HYDRAULIC GOLD MINING CO. Capital stock, $500,000. Principal offices in Denver, Colo., and Weaverville, Trinity county, Cal. Directors—L. L. Hailey, William Gelder, A. C. Dunbar, E. S. Rogers, Frank B. Adams and George Arthur Price.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 3.		WEEK ENDING Aug 10.		WEEK ENDING Aug. 17.		WEEK ENDING Aug 24.	
Alpha	.10	.15	.16	.20	.15	....	.15	.15
Alta	.25	....	.30	....	.25	....	.25	.20
Andes	.25	.30	.35	....	.30	.35	.30	.25
Belcher	.85	.95	.90	.95	.80	.90	.45	.85
Belle Isle	....	....	....	....	.10	....	.05	....
Best & Belcher	1.25	1.50	1.30	1.55	1.30	1 40	1.30	1.05
Bullion	.15	.35	.30	.35	.20	.25	.25	.10
Bodie Con	....	....	.30	....	.25	.30	.25	....
Bulwer	.40	....	.40	....	.30	....	.30	....
Commonwealth	....	....	....	....	.10	....	.10	....
Con. Va. & Cal	3 20	3.30	3.20	3.50	3 20	3.45	3.30	3.10
Challenge	.25	.30	.35	....	.25	.30	.25	.20
Chollar	.50	....	.55	.65	.50	.60	.50	.40
Confidence	1.30	....	1.35	....	....	....	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Caledonia	.10	.15	....	....	.15	....	.15	....
Crown Point	.55	.60	.55	.60	.50	.6	.55	.40
Crocker	....	....	....	....	....	....	....	....
Del Monte	....	....	....	....	....	....	.05	....
Eureka Con	..	..	1.50	1.60	....	....	2.00	....
Exchequer	....	....	.05	.10	.05	....	.05	....
Grand Prize	....	....	....	....	.05	....	....	....
Gould & Curry	.80	.90	.80	1.05	.85	.95	.85	.65
Hale & Norcross	.95	1.05	.95	1.05	.75	1.00	.75	.45
Julia	....	....	....	....	....	....	.05	....
Justice	.05	....	.10	....	.05	....	.05	....
Kentuck	.05	....	.05	....	.05	....	....	....
Lady Wash	.05	....	.10	....	....	....	....	....
Mono	....	....	....	....	.15	....	....	....
Mexican	1.25	1.35	1.30	1.45	1.20	1.30	1 25	1.05
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	.05	....	....	....	....	....	.05	....
New Queen	.20	....	.20	....	.20	....	....	....
Occidental	.30	.35	.30	.45	.40	.45	.40	.30
Ophir	2.05	2 25	2.15	2.40	2.15	2.40	2.15	2.00
Overman	.25	.30	.25	.30	.25	.30	.30	.25
Potosi	.45	....	.50	.60	.45	.55	.45	.35
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	....	....
Savage	.90	1.00	.90	.95	.65	.93	.70	.55
S. B. & M	.15	....	.20	....	.20	....	.15	....
Sierra Nevada	.90	1.00	1.05	1.35	1.05	1.30	1.05	.90
Silver Hill	....	....	.05	....	....	....	....	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.70	.75	.80	1.05	.75	1.00	1.05	.75
Utah	.20	.25	.20	.25	.20	.25	.20	.15
Yellow Jacket	.45	.55	.50	.60	.50	.55	.50	.40

*Assessment added.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 16	English, lb	— @ 18
BORAX.		Canton tool	— @ 6½
Refined, in car lots	— @ 7½	Sit's Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	9½ 10
Concentrat'd, do	— @ 6¾	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 00
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 6 00
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 6 00
Fire Box Sheets	22 @ 24	Do, do, 20x28	—@12 00
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot per lb	— @ 24
Norway, base	— @ 4½	**COAL.**	
PIG IRON.		**SPOT FROM YARD—PER TON.**	
	Spot.	Wellington	$8 00
Eglinton per ton	22 00@ —	Gretta	6 75
Glengarnock	23 00@ —	Nanaimo	7 00
Am. Soft, No. 1	24 00@ —	Gilman	6 00
Oregon Pig	—@—	Seattle	6 50
Puget Sound	—@—	Coos Bay	5 50
Clay Lane White	24 00@ —	Cannel	8 50
Langloan	22 00@ —	Egg hard	11 50
Thorneliffe	23 00@ —	Cumberland, in sacks	14 00
Gartsherrie	22 00@ —	Do, bulk	13 00
Barrow	22 00@ —	Wallsend	7 00
Cargoilleet	22 00@ —	Scotch Splint	7 00
CHROME IRON ORE.		Brymbo	6 75
Per ton	10 00 @ —	West Hartley	7 50
LEAD.		**TO LOAD—PER TON.**	
Pig	— @ 4½	Australian	5 75@ —
Bar	— @ 5½	Liverpool Steam	6 00@ —
Sheet	— @ 7	Scotch Splint	6 00@ —
Pipe	— @ 6½	Cardiff	6 25@ —
SHOT.		Lehigh Lump	12 00@ —
Drop, sizes *smaller* than B, per bag of 25 lbs	$1 85	Cumberland	9 00@ —
Do do, B and *larger* sizes per bag of 25 lbs	2	Egg hard	10 00@ —
Buck, Balls and Chilled do, per bag of 25 lbs	2 10	West Hartley	6 50@ —
QUICKSILVER.		**COKE.**	
Home trade, per flask	43 50 @44 00	English, to load	$8 00@ 9 00
For export	38 @	Do, spot, in bulk	—@10 00
		Do, in sacks	—@12 00
		Cumberland	9 00@ —

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 25, 1892.

General trade the past week was fairly active. Buyers for interior houses report freer purchases than at any time in this year. They also say that their orders indicate caution and no desire to stock up beyond near-by trade requirements. Not even prospective higher prices in any line of goods offer sufficient inducements for overbuying. The margin of profits on all goods sold is the smallest ever before known. They appear to have been reduced through competition and other causes to such low percentages that business in some branches is only carried on for the pure love of being in business and not for the money there is in it. The low freights by sail from the East to this port are largely in favor of this city, and if only lower local freights could be secured, then trade would again be booming. With foundrymen and ironworkers in general a fair degree of activity is reported, but under close figuring through competition, the profits are small. The lower prices at which raw material is generally being secured are largely in their favor. The present and seemingly unwarranted depression in the market value of silver has contributed largely in curtailing the demand for mining machinery. There is a growing impression with better informed financiers that the leading commercial countries of the world will be forced to take action looking to remonetizing of silver, but whether it will be done at the coming International Monetary Conference is an open question; but that it will be done within the next five years is conceded by all. It is quite generally affirmed that England will be certainly most affected by the decline in silver, though a gold-standard government, because she is so closely connected in a mercantile and political way with the East, where silver is the standard. English merchants are simply preparing for any storm that may break. By being prepared, half the trouble is averted. The proposed silver conference may be the means of helping the mercantile and financial world out of the trouble into which it is now plunged. The exports of gold from this country continue, with, seemingly, no let up. The exporting of gold is claimed to be due to continued unloading of American seeurities by European investors. It this be true, then there must be a powerful moneyed syndicate at the East taking all that is offered, for the market not only absorbs all that is offered without shading prices, but, on the contrary, firmer prices obtain. The local money market is fairly easy, notwithstanding an increasing demand for funds with which to move the crops. Remittances from the interior are fair, free from the large fruit-growing sections, but light from other localities owing to farmers storing their grain. Eastern mail advices report an outflow of currency to the agricultural States for crop purposes. The general tenor of advices from the East are of a decidedly favorable character.

SILVER—The market has fluctuated slightly. The very low prices now ruling would, under ordinary circumstances, lead to an active bull campaign, but just at this time it seems as if those who have been bullish in their operations are not now prepared for active operation, while the strong bear syndicate does not appear to be quite ready. There are those who still claim that the price of the metal will go to about 80 cents in New York before the manipulators are prepared to commence pegging on an advance. What the prediction for lower prices are grounded on we do not know. Advices from Mexico report silver mining demoralized, and we might also say that the same condition obtains in the United States. The production is being curtailed in every silver-producing country.

MEXICAN DOLLARS—The market is quiet at around 67½ cts.

QUICKSILVER—Receipts the past week aggregate 475 flasks. The market is quoted unchanged, but it is reported that sales have been made at lower prices.

TIN—There was received from San Diego the past week 214 pigs. The market for both pig and plate is inactive and barely steady.

PIG LEAD—The market is sluggish, with a steady tone reported. At the East our advices report a slow market with both producers and consumers indifferent. It is claimed that the production is lessening.

COPPER—The market has held fairly firm. New York mail advices report an inactive market, with "very little, if anything, more than merely routine buying, and efforts in the direction of inducing consumers to take hold more liberally are apparently unavailing. Prices have undergone no decided change. Current quotations are 11⅝@11¾c for Lake Superior product, 11c for electrolytic, and 10⅝@10¾ for common casting brands."

PIG IRON—Imports the past week aggregate as follows: 447 tons from New York and 800 tons from Newcastle, England; total, 1247 tons. The local market is reported largely in buyers' favor, owing to liberal supplies here and on the way. New York mail advices to August 20th report as follows: "The slow condition of affairs in the manufactured iron trade still so offsets the reduced production of pig iron that the market for the latter remains in rather poor shape. Thus, a southern producer is said to have sold gray forge delivered in central Pennsylvania, four months, at $12, equal to $7 94 at furnace, which rate is understood to be the lowest yet made. Pittsburg makers of gray forge have reduced their price to $12.50. It is remarkable in connection that the southern output is undergoing a sharp reduction. The Tennessee Co. has stopped two furnaces at Birmingham on account of the condition of the market, and has been forced by the Tennessee labor riots to bank the two South Pittsburg furnaces. It is reported also that three De Bardeleben stacks have been banked, owing to a controversy over an ore contract. Some Virginia furnaces have also stopped, making altogether a considerable reduction during the past week or ten days."

COKE—Imports the past week aggregate 1541 tons. The market is essentially unchanged.

COAL—Imports the past week aggregate as follows: Coos Bay 1610 tons, Nanaimo 2840, Sydney 1603, Seattle 1251, Departure Bay 1550, Tacoma 4700. Total 13,554 tons. The market, contrary to general opinion, does not anvance, notwithstanding the advanced season. The consumption so far is less than had been expected even by the best informed. It is claimed that the largest consumers are well-supplied for near-by and distant wants. They bought under the belief that the supply would lessen, and, as winter months approached, higher prices would rule. More vessels are loading at Newcastle, N. S. W., for this port.

Mining Share Market.

SAN FRANCISCO, Aug. 25, 1892.

During the week under review, the market for shares in the Comstock mines has been going from bad to worse, which gives color to the general belief that Bob Morrow and his tools in the board succeeded in putting into force the reported order of D. O. Mills for lower prices. Although the market has shaded off from 10 to 20 per cent, yet it looks as if the bottom has not been touched. The bear orders have so far been easily executed, and that, too, without the rings losing a share. The long, continuous drag with assessments following assessments, while much of the bullion was spirited away, has driven the better class of outside operators from the thieving game, and left the chronic traders to the tender mercy of bands of hyenas. It is only to be hoped that the latter, for the want of other food or spoils, will commence on each other, in which event outsiders may stand a far better show of coming out ahead. The long-drawn-out civil suit of the Mining Stock Association against the late directors of the Hale & Norcross Mining Co. is creating adverse criticism. The question is being more generally asked why the association, if it desires to have created true reforms on the Comstock, does not commence criminal proceedings against those who are charged with about every crime that it is possible to accuse them of? There are many who are inclined to the opinion that the association stands very much in the light of a dog in the manger, or, in other words, they will not force the issue by criminal proceedings, while by their actions they deter others. While giving the side of chronic growlers who never do anything but wail. Micawber-like, for something to turn up, yet to the writer it seems that the association has accomplished very much, and for which the members deserve credit. They have made a fight, and a strong fight too, against a powerful moneyed combination and brought to light much that was not before known. In the securing of the evidences of guilt against the mill rings and their tools, time and a large expenditure of money were necesssary, both of which were used economically and with the best possible results, which was clearly shown at the suit of M. W. Fox against the late directors of the Hale & Norcross Co. The net of facts which was brought out in evidence, was so closely woven that it was impossible for the conspirators to escape. And now for the result. There cannot be the least doubt but the case will be appealed, or, at least, it looks so now; yet the conviction has dawned on the minds of some of the other Comstock millowners that unless reforms are instituted in the working of the mines, and in the milling of ore so as to have the law under which the companies incorporated, conformed to, they may get into far more serious trouble than have the late directors of the Hale & Norcross Co. The Overman Mining Co., which, it is claimed, that Bob Morrow controls, was the first to accept the situation and give public the average car-sample assays of all ore hoisted. The company also had the superintendent give fuller and more detailed reports of work done on each level in the mine. While the company ran behind financially, and found it necessary to levy assessments, yet in obeying the law the officers cannot be too highly commended, for it looks as if, should they show up a valuable deposit of ore, outside shareholders will get some benefit. Not content with conforming to the law, the Board of Directors of the company met lately and appointed two members to visit Virginia and report on the feasibility of buying or leasing a mill to reduce the ore, which is now said to be low-grade assaying about $17 per ton, at a saving on present cost. The Savage Mining Co. is also apparently moving in the direction of reform. It is also claimed that the Hale & Norcross Co. management is looking "kind o' cross-eyed" toward reform. It is only necessary to get an entering reform-wedge in on the Comstock so as to split the mill rings wide open and bring about the long-needed reforms.

After draining all the mining shares possible from the outsiders, the Pumping Association announce that everything will soon be in readiness to commence pumping the water from the Gold Hill mines. The association has been about three years getting ready, during which time assessments followed with the regularity of clockwork, to get money to defray the expenses.

It has not been officially announced to whom the three stray bars of bullion belong. The old game of "Thimble, thimble, who has the thimble," is doubly discounted by the new game of "Bullion, bullion, who gets the bullion."

It looks as if the brokers first sold themselves, and the buyers having very little use for them now, are desirous of selling the Stock Exchange building.

News from the Comstock mines is uniformly favorable. Private advices report very rich ore in two of the North End mines, in one of the Middles and in three of the Gold Hill mines, and also in Occidental. But then the more that rich ore is reported the lower goes the share market and the more assessments are levied. It is now claimed that there will be sufficient water in Carson river next month to run the mills situated on the river, and in anticipation of such an event more miners are to be put to work in the Gold Hill mines. This probably means more assessments, provided there is no change for the better in their management. It is claimed that Con. Imperial and two or more other mines in the Gold Hill group have been systematically looted through the Yellow Jacket or in some other way. If this is so, it is to be hoped that those who are guilty will be brought up with a round turn.

From the outside mines the news continues of a favorable character but the market value of the shares is so low as not to attract attention to the mines.

The market opened this morning very strong at an advance in Hale & Norcross, which caused the list to sympathize. After regular Call, trading became more active, with a gain at the close of informal session this morning. Although the market acts as if it might do better, yet the prevailing opinion is that the inside is not quite ready to aid in promoting a deal.

Eastern Metal Markets.

NEW YORK, Aug 24.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	37⅝	82½	11 50	4 00	20 35
Friday	37⅝	82½	11 50	4 00	20 35
Saturday	38	82½	11 50	4 05	20 40
Monday	38 3-16	83¼	11 50	4 05	20 45
Tuesday	37 15 16	82¾	11 50	4 05	20 45
Wednesday	37 15-16	82¾	11 50	4 05	20 35

Quicksilver is weak and unsettled at a further decline. Pig Iron shows signs of steadying off. Tin is barely steady. Copper is inactive but steady. Borax is slower.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Best & Belcher M Co, Nevada	52	25c	Aug 17, Sept 29, Oct 13		L Osborn, 309 Montgomery
Bullion M Co, Nevada	39	25c	Aug 11, Sept 16, Oct 4		R R Grayson, 331 Pine
California Verde Antique Marble Co, Cal	2	1c	July 12, Aug 22, Sept 12		W J Gurnett, 308 Pine
Confidence M Co, Nevada	24	50c	Aug 13, Sept 15, Oct 6		A S Groth, 414 California
Crocker M Co, Arizona	12	5c	Aug 11, Sept 20, Oct 18		A Waterman, 309 Montgomery
Del Monte M Co, Nevada	6	10c	July 26, Sept 5, Oct 5		J W Pew, 310 Pine
Evening Star M Co, California	5	1c	Aug 19, Sept 21, Oct 8		J J Scoville 320 Sansome
Exchequer M Co, Nevada	33	1c	July 27, Aug 31, Sept 20		C E Elliott, 309 Montgomery
Florida Hill M Co, Idaho	4	3c	July 29, Sept 2, Sept 28		R R Grayson, 331 Pine
Gold Mt M Co, California	3	$2	July 16, Aug 20, Sept 8		J F Curtis, 325 Montgomery
Golden Fleece Gravel M Co, California	17	—	July 16, Aug 21, Sept 20		W J Gleason, Phelan Block
Gover M Co, California	3	1c	July 28, Sept 1, Sept 28		R McF Doble, 15 Fremont
Guasacaran & California M Co, Honduras	7	$1.50	Aug 9, Sept 15, Oct 8		E Oliver, 22 Mint Avenue
Hale & Norcross M Co, Nevada	102	50c	Aug 11, Sept 15, Oct 7		A B Thompson, 309 Montgomery
In Yeguada ice M Co, Nevada	17	5c	Aug 15, Sept 29, Oct 13		J W Pew, 310 Pine
Justice M Co, Nevada	61	10c	July 26, Aug 31, Sept 19		R Kelly, 419 California
Kentuck M Co, Nevada	4	10c	July 1, Aug 18, Sept 8		J W Pew, 310 Pine
Keystone Con M Co, California	3	$1	Aug 27, Sept 28, Oct 18		J H Isham, 310 Pine
Mountain Tunnel M Co, California	5	7c	July 28, Aug 27, Sept 26		E C Lauder, 219 Sansome
Navajo M Co, Nevada	22	10c	Aug 17, Sept 21, Oct 14		J W Pew, 310 Pine
Peer M Co, Arizona	13	10c	July 19 Aug 25, Sept 23		A Waterman, 309 Montgomery
Peerless M Co, Arizona	18	5c	July 6, Aug 11, Sept 7		A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	5c	July 11, Aug 14, Sept 12		G R Spinney, 310 Pine
Silver Hill M Co, Nevada	31	5c	Aug 2, Sept 6, Sept 27		D C Bates, 309 Montgomery
Silver King M Co, Arizona	8	25c	July 19, Aug 27, Sept 27		J W Pew, 310 Pine
Tereza M Co, Mexico	8	1c	Aug 13, Sept 22, Oct 8		K G Willat, 309 Market
Union Cons M Co, Nevada	46	20c	July 18, Aug 24, Sept 13		A W Barrows, 303 California
Western Star M Co, California	1	2c	July 25, Aug 30, Sept 21		J A Reed, 328 Montgomery

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Gold Mountain M Co	Annual	J F D Curtis, 325 Montgomery	Sept 6
El Dorado Slate Co, California	Annual	R M Welch, 3 3 California	Sept 9
El Leopoldo M Co, Mexico	Annual	Jabez Howes, 130 Sansome	Aug 26

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborn, 309 Montgomery	April 28
Champion M Co, California	15	T Wetzell, 310 Pine	Aug 18
Coos Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Aug 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

NOTICE OF ASSESSMENT.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Amador City, Amador County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of August, 1892, an assessment, (No. 3) of One Dollar ($1) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room 43, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 18th day of October, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. H. ISHAM, Secretary.

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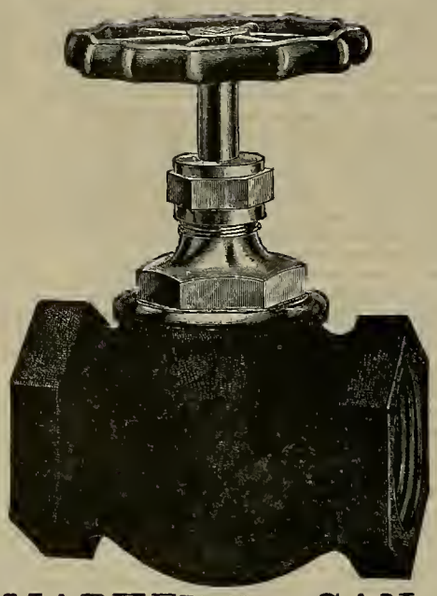

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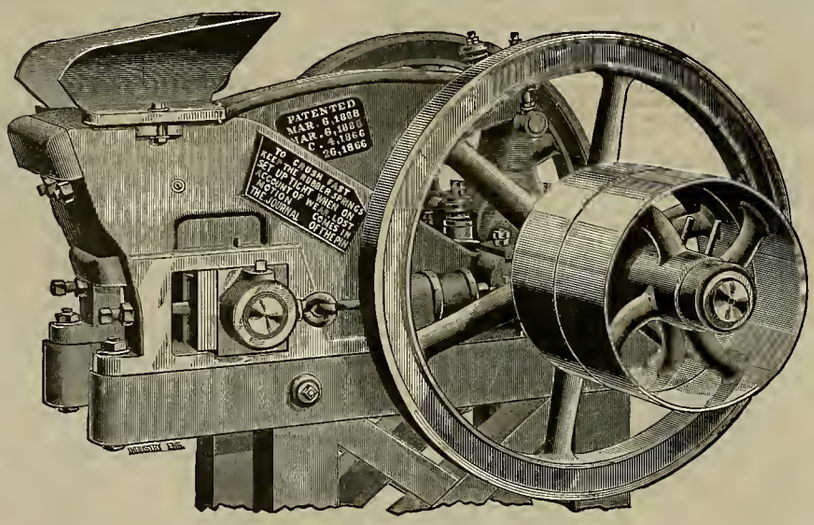

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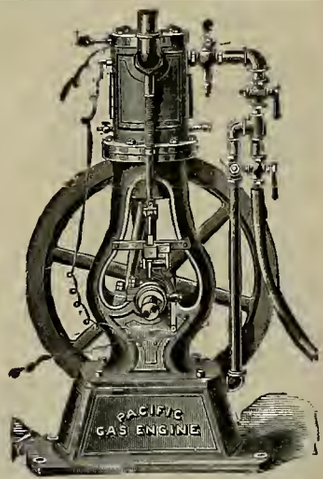

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An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL. LXV.—Number 10. DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, SEPTEMBER 3, 1892.

Three Dollars per Annum. SINGLE COPIES, 10 CENTS.

A Pneumatic Railroad Signal Apparatus.

On a place like the Oakland mole, where they have a complete electric and air-compressing apparatus for operating the block-signal system, it is very easy to arrange for automatic signals for crossing or passing trains, but at line. By the mechanism and system devised the passing train furnishes the power to operate the signal, which can he placed at some distance from the place where the power is applied. This is accomplished by the use of a pneumatic track-instrument, which consists substantially of a lever acting upon a diaphrsgm which fits within a chamher, the produced by any diaphragm movable within a chamber and a suitable conoection between the diaphragm and the wheels of a passing train, either directly or hy depressing a portion of the track itself as the train passes. Tn operate a signal or bell to protect a road crossing they use three track-instruments, two contact instruments, and an

Fig. 1

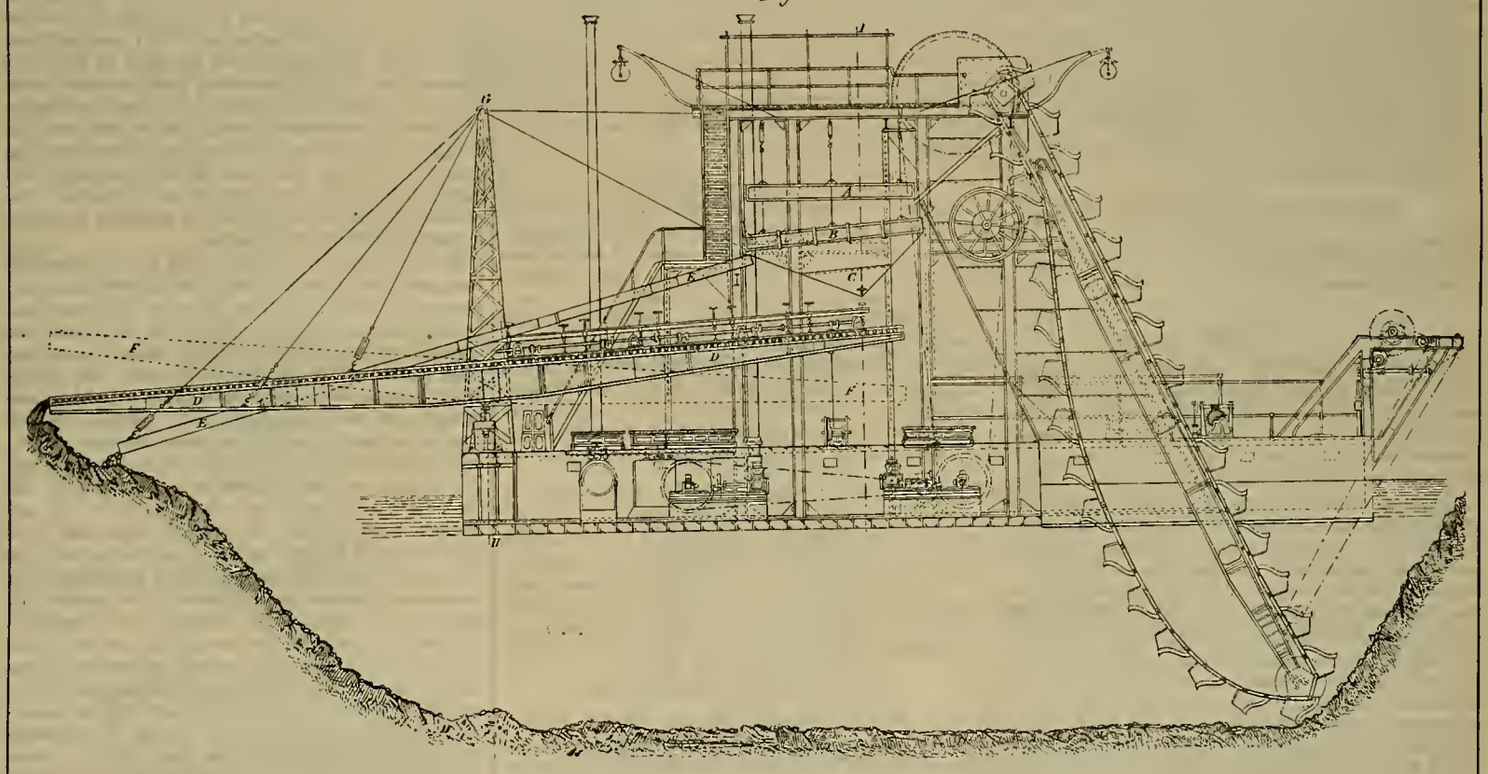
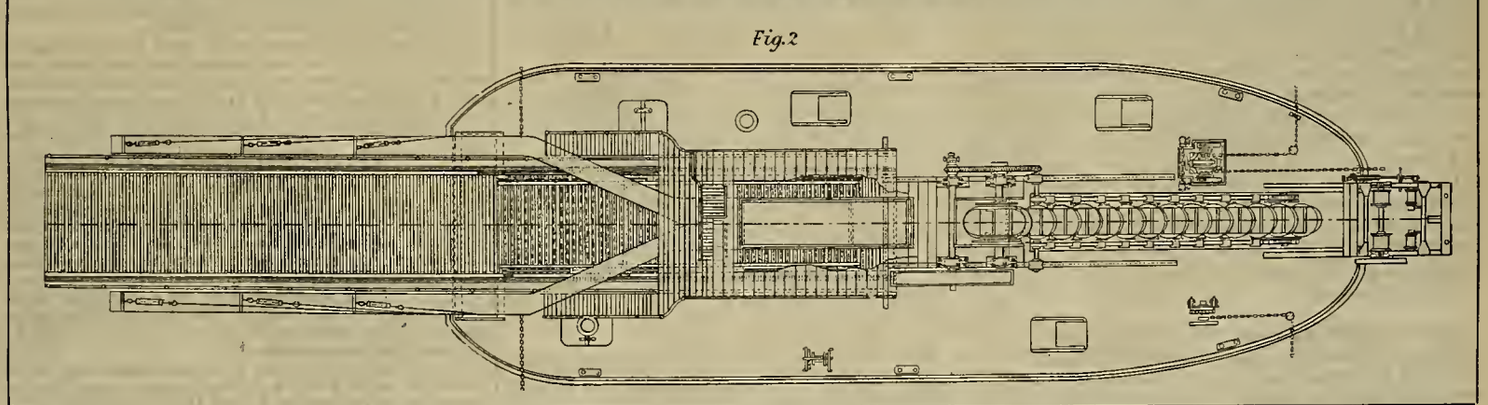


Fig. 2



FIGS. 1 AND 2—SECTIONAL VIEWS OF DREDGE FOR AURIFEROUS RIVER BEDS. (SEE PAGE 155)

stations, crossings or tunnels way off on the main line this cannot readily be done without the aid of a man. Wm. W. Slater and Harry O. Barnes, electricians, in the employ of the Southern Pacific Company, at Oakland mole, have recently invented and patented a pneumatic electric-circuit-controlling and interlocking apparatus which dispenses with all electrical circuits in the rails and all underground wiring. This they have applied at the Fourteenth street crossing of the narrow gauge line in Oakland, at the San Fernando tunnel, and other places on the main lever being acted upon by the wheels of a passing train so as to depress the diapahragm within the chamber as each wheel passes over it, and produce a vibration or pulsation of the air through a pipe to a point where the electro-pneumatic mechanism is to be actuated by this column of air. The diaphragm and lever are immediately returned by a spring after each depression by the wheels, so that there will be a constant reciprocation and corresponding pulsation of air in the conducting pipes while the train is passing. This movement or pulsation of the air may be electro-pneumatic instrument. Tbe hell is kept ringing while the train is passing, and only stops when it has entirely passed. It is sometimes necessary to give an engineer a signal at certain points to look out for danger or for other purposes. In such a case the mechanism opens a valve in an air-supply pipe and sounds a whistle which is situated near the track so that the engineer cannot fail to hear it. For making the necessary pulsations to operate the mechanism only about one-quarter of an inch of movement is necessary, the lever working with that.

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SAN FRANCISCO, SATURDAY, SEPTEMBER 3.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Well Machinery—American Well Works, Aurora, Ill.
Dividend Notice—Pacific Coast Borax Co.
Situation Wanted—E. M., Los Angeles.
See Advertising Columns.

Comment.

As is generally known, the larger electric companies in the East have formed a consolidation of interest, with a capital of fifty millions of dollars. The new General Electric Company has absorbed the Edison and Thompson-Houston system, the latter with its associates representing $39,000,000 and the Edison about $11,000,000. This new company has virtually absorbed most of the outside corporations, with a few exceptions. The big company still has a fight on its hands with some of the other companies controlling other valuable systems. Electric lighting has become so common and general that it has become a question of efficiency and cheapness, as to which system shall prevail. It would seem that the long-distance system, if at all perfect, must necessarily leave a direct system in the lurch. Moreover, in the long distance transmission it is absolutely essential that the alternating system should be used, as the cost of the direct current would be out of the question on account of the enormous cross-section of copper which would be required for the transmission of the quantity necessary. As the horsepower shows the consumption of coal per hour, those plans which require more power than others can not financially cope with cheaper machinery. The general outlook of the business is that it is only a question of time when the existing difference between large territorial agencies will be settled, resulting in a powerful monopoly as great, if not greater, than that of the telephone. The result of this will be the cutting up of small establishments which have made it a business to live off of the already acquired rights and patents of others, but have existed solely from the fact that the larger companies have never fully and thoroughly adjudicated their respective patent rights.

Cholera has been for some weeks epidemic in Russia, and has got to Amsterdam, Antwerp, Bremen, Paris, Havre and other European cities. In Great Britain there have been a few deaths in London, Glasgow and Swansea. On Wednesday it came to New York in a steamer from Hamburg, 22 deaths having occurred on the voyage over. The vessel is under strict quarantine, of course, but it is evident we are in imminent danger of a visitation from this plague. In San Francisco, steps have already been taken to "clean house," and a house-to-house inspection has been commenced. Strange to say, the Chinese were the first to take alarm, and an order from their consul set the Mongolians at work cleaning up Chinatown. California has a great advantage in being on the further side of the continent, but it is remembered that when cholera was last prevalent in the United States, we did not escape. What once happened may easily happen again, and it is the part of wisdom to make preparation by establishing the best attainable sanitary conditions. From its situation directly upon the ocean and in the very teeth of the daily ocean breeze, San Francisco has less to fear than the interior where it is hotter and where general sanitary conditions are not so good. It was in the Sacramento valley, notably in the cities of Sacramento and Marysville, that the plague raged most fiercely at the time of its former visit. It was in 1850, the second year of the cholera invasion in the United States, that the plague followed up the army of immigrants which on the 1st of July was scattered for 2000 miles along the route from St. Josepb, Missouri, to Sacramento. It reached the latter city about September 1st, and remained with it until November. At San Francisco there were a few cases, but the disease did not become epidemic, while in the higher regions east and north of the Sacramento there were no cases at all.

The World's Fair Commissioners are beginning to realize that it is no longer an easy matter to collect gold specimens for exhibition purposes in this State. When the miners get them out, they want to sell them and get the money, and the commission cannot afford to buy them, consequently, our exhibition of gold ores is not apt to be anything very striking or wonderful. The State Mining Bureau at one time had a fine collection, but they were stolen from the museum, and those added since do not equal them in value or beauty. Of course, some very good specimens could be obtained from private collections, but the fact is, miners fail to see how they are individually benefited by a display of specimens unless they have a mine or stock to sell. People look at them and say, "How pretty," and that is the end of it. It is really the gold ores which show no gold from which the bulk of the product of the State comes.

A vessel arrived in this port on Monday with a cargo of 1450 tons of coal from Coal Bay, Cooks Inlet, Alaska, the first cargo of any size ever brought from that Territory. There is said to be a plentiful supply of coal in those arctic regions, but it is only of late that it was developed. It is a very important thing for this State, which is poorly supplied with coal, and our largest supplies come from foreign sources at present. A plentiful supply from American soil, with no duty to pay, will have an important bearing on industrial affairs in this city and throughout the State. Should the new mines prove as productive as is claimed, in a very short time lines of steam colliers will be established between Cooks Inlet and this port.

In the article on "Tests for Water," in the PRESS of last week, the test given for gypsum, Mr. C. H. Aaron tells us, is really a test for sulphuric acid or any soluble sulphate. Many waters contain sodium, magnesium or iron sulphate, while a few contain free sulphuric acid. All such would be judged to contain gypsum, according to the test in question, which is therefore misleading in that regard.

Recovering Gold from Solutions.

There are many complaints from people who have been working or experimenting with the MacArthur-Forrest Cyanide process that they are unable to obtain the results expected, and that they are unable to obtain a satisfactory explanation for the failure. There seems to be no difficulty in getting the gold into solution, but there is a good deal of difficulty in getting it out. The zinc shavings, used by the MacArthur-Forrest people for precipitating the gold, do not appear to accomplish their object as well as they ought. One man finds gold precipitating wherever the solution flows. Another finds that the gold in the original ore has been all practically dissolved out, and the tailings show little trace, but he does not get the gold from the solution and does not know where it has gone. It is the duty of the chemist of the works to find this out, and if he cannot, then he is a poor chemist and should quit "cyaniding" and go to sawing wood. It must be there somewhere and ought to be found.

But it is exasperating to the mine-owner to find his gold taken from the ore by "chemicals" used for the purpose, and then not be able to find where it has gone. If it all goes into a solution from which only half can be recovered, why the process can hardly be considered a complete success. At any rate, the precipitating substance is not, and something better will have have to be devised before the system becomes what it is claimed to be.

Some of the men using the process find a mysterious white powder precipitated, the nature of which is rather a conundrum and should be investigated by some competent person, as, if it is auriferous, it may account for a part at least of the loss, being perhaps washed away by water when the gold is collected from the boxes, or carried, suspended in the solution, to the storage tanks, etc.

Foundry Notes.

A New Departure at the Risdon Iron Works.

The Risdon Iron Works of this city have of late been making a specialty of machinery and equipment for electric railroads, of which many are now being built in this State. The equipment includes engines, boilers, condensers poles, pole-brackets, switches, chairs, etc. The Risdon works have equipped the San Francisco and San Mateo electric road with 1000-horsepower engines; the Metropolitan electric road with 500-horsepower; Oakland, Haywards and San Leandro, 300; Santa Cruz, 200; Stockton, 600; Capital Gas Co., Sacramento (light and power), 500; San Diego road, 250. They have a contract now for a 500-horsepower engine for the East Oakland electric road; and one for the Oakland, San Leandro and Haywards electric road for 500-horsepower Ball engine and Heine boiler.

Some of the engines furnished are Corliss and others Ball high-speed engines. For many of the roads mentioned, the works furnished the entire equipment of chairs, switches, poles, etc. The poles have been specially designed and patented by the Risdon Rorks.

They are also making a great many Bryan mills, for ore, and a number are being sold to people who have been using them for some time. The Bryan mill is intended for use in place of stamps, and is a modification of the well-known Chile mill arranged for the continuous wet-crushing of either gold or silver ores. It consists of an annular mortar containing fixed segmental steel dies arranged in the path of its three crushing rollers, which, in a five-foot mill, are 44 inches in diameter, seven inch face, weighing 3500 pounds each, whose axles are fixed in them, and journaled in a central revolving table, attached to and driven by a belt pulley, making a very direct application of power. A four-foot mill has a similar arrangement of dies, but smaller rollers, weighing 1200 pounds each, exclusive of the drum, which rests on their periphery, adding to their weight and driving them by friction. The crushing weight of the rollers can be increased as desired by loading the tank driving pulley.

There mills have an unusually large area of screen surface, permitting it free discharge of all pulverized ore, thus preventing sliming. They are excellent gold amalgamators, and many prefer them to stamps, for the reason that they are portable, quickly and cheaply erected, require less power and a less first cost than stamp mills. The Risdon Works manufacture complete gold and silver mills in connection with these pulverizers, and, if required, furnish them in sections for packing over mountain trails. In its operation of the mill the pulp runs around the mortar next to the screens on a rapid current of not less than 300 feet per minute; but toward the center insides of the rollers the movement of the pulp is much slower, and as the gold is liberated from the matrix it falls to the eddy side of the current and in practice is found amalgamated in mass around the cone on the center of the mortar. By this action of free gold is not subjected to the continuous grinding of the roller on the mass of pulp, and nearly all the gold in the ore, fully 80 per cent, is retained in the mortar. The ore does not slime, and the sand and pyrites are left of uniform size and in good condition for concentrating. The clean-up of the mill, owing to the simple arrangement, is done with great ease. Many of these mills are now in operation on this coast, in Virginia, Georgia, Mexico, Tasmania and Australia.

The Risdon Works have lately made a radical departure in their line of business by going into the agency for eastern concerns very extensively. They now have as large a line of special goods as is carried by any ordinary commission-house here, and have a special building, opposite the works, where these things are kept. The articles include engines, pumps, blowers, gas engines, water-gates and all manner of small things. In filling their contracts for mining, milling and other machinery, they can often take from their consignments small machinery, etc., to advantage, whereas unless they were able to do this, the entire work would go East. This step has been taken because the labor strikes and rate of wages paid have made competition in certain lines simply prohibitory. If men want engines or other machinery made to order, they can get them at the Risdon; if they want cheaper articles, ready-made, these can also be furnished, if desired, by the same works.

They propose to introduce here the new improved Hill-Wheelock engine which is similar in design to the Corliss except the valves, and can be run 125 revolutions a minute, and be belted direct to a generator, doing away with countershafting, pulleys, etc. In this engine the percentage of clearance is down to 1½ per cent, and the makers are prepared to guarantee that the engines will develop a horse power upon 13½ pounds of dry steam per hour. This is five pounds less than the makers of the best engines are willing to guarantee, and if the guarantee can be faithfully carried out there is no reason why the engines should not be extensively adopted. There is every reason to believe that the Risdon will have a large run on this engine. For the purpose of ascertaining if the representations are correct, Mr. Dorward is now East investigating, and his reports to date are very satisfactory, the engine at Worcester having been run three years without perceptible wear.

Dredging for Gold.

We never had very much luck in dredging the California rivers for gold, although there is supposed to be a great deal in the beds. Still, such dredges as we have put in operation here, while they have brought up sand, gravel and stones, did not bring up gold enough to pay expenses. We have even tried to dredge outside the surf at the gold bluffs up the coast and made a failure of it there, as well as in the rivers. A dozen different river-dredging enterprizes have been started in this State, but there were no returns from any of them. It is different in some of the Australian rivers, where the dredging machines have been in operation for years. There the machines have enabled the companies to pay dividends. In some other parts of the world, too, river-dredging for gold has paid. We give herewith illustrations of a dredger constructed by Messrs. E. F. Lacour and Thomas Figee, of Haarlem, for the excavation of gold-bearing soil in the River Orba, near Alexandria, Piedmont, and which is of interest as a step in the direction of dealing on a large scale, and at low cost, with alluvial deposits containing but a small percentage of gold, and which, therefore, could not be economically treated in the ordinary way. The machine comprises not only a dredger, but also a washing plant for concentrating the dredged material, and at once getting rid of the bulk of the debris.

Fig. 3.

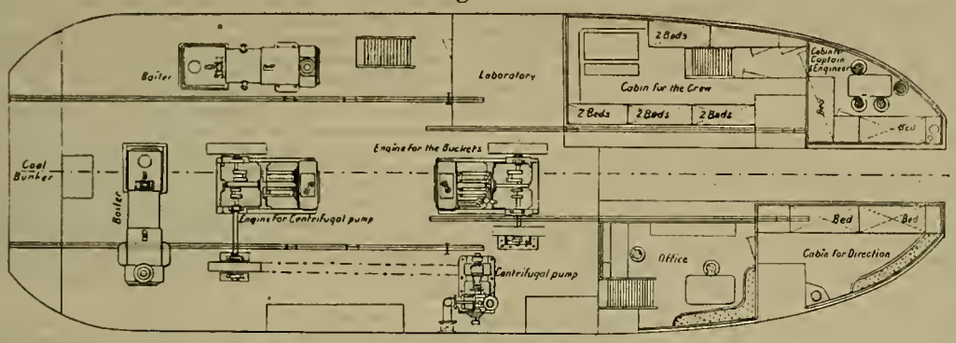


FIG. 3.—DECK PLAN OF DREDGING APPARATUS.

Fig 4

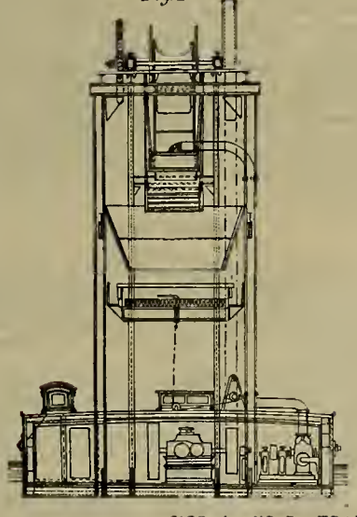
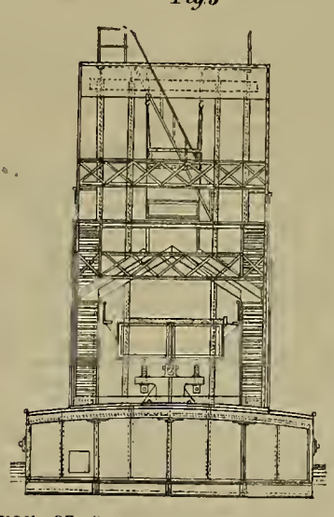


Fig 5



FIGS. 4 AND 5.—TRANSVERSE SECTION OF DREDGER.

Referring to the longitudinal section and plan (Figs. 1 and 2) and to the two transverse sections (Figs. 4 and 5) it will be seen that the whole plant is mounted on a flat-bottomed barge of shallow draught, which, in addition to affording cabin accommodation for the crew, also contains a laboratory and cabin for the metallurgists in charge. The dredging apparatus is of the ordinary bucket-and-ladder type, and requires no special description; it is driven by an independent engine, and its arrangement will be at once understood on reference to the views above referred to.

The dredged material is delivered by the buckets on to the screens at B, the frame B, which has a jigging motion imparted to it, containing three screens of different degrees of fineness, placed one above the other. Thus the top screen is a strong one, having meshes 1-6 inch square, which receives the shock of the material falling from the buckets, while the second and third screens have meshes 0-4 inch and 0-16 inch square respectively, the latter screen being of steel wire gauze.

Above the screens is a water trough A, which receives the water from a centrifugal pump capable of delivering 154,000 gallons per hour, and driven by an independent engine. The bottom of the water trough is perforated all over with holes one-fifth of an inch in diameter, and through these the water falls in a shower on to the materials on the screens. By the action of the screens about four-fifths of the dredged material is separated from the rest, and passed on to the inclined pipe E, through which it flows, mixed with water, to be again deposited in the river bed a sufficient distance in the rear of the dredger. The screens are also provided with a special arrangement which prevents any large pieces of gold from passing off to waste with the lighter debris.

By the arrangements just described about four-fifths of the dredged material are, as we have already stated, at once got rid of; the remaining fifth passes through the finest screen and falls into the hopper C. At the bottom of this hopper is a distributing apparatus, which mixes up the sand and water and causes a steady stream of the mixture to fall through the discharge opening in the bottom on to the sluice D. This sluice is a kind of shallow canal 82 ft. long by 9 ft. 10 in. wide, the bottom being crossed by grooves or flutings, and it is supported by an iron frame at the stern of the vessel, the support being hinged in two directions, so that the level of the sluice can be adjusted either laterally or longitudinally. The former adjustment is necessary to counteract any list or cant which the vessel may have to port or starboard, which cant, if uncorrected, would interfere with the maintenance of a uniform depth of flow over the whole width of the sluice, a uniformity which is essential to its proper working. The lateral adjustment of level is effected by screws, while longitudinally the inclination of the sluice is regulated by a chain led from a winch placed on the deck (as shown in Fig. 1). This sluice can, when required, be inclined so that its inboard end is the lower of the two, as shown by dotted lines; the use of this we shall explain presently.

Referring to Fig. 1, it will be seen that over the upper half of the length of the sluice there extends a shaft; this shaft carries eccentrics which impart motion to a series of distributing rakes, these rakes acting on the mixture of sand and water as it flows over the sluice. The teeth of these rakes also retard the flow of the water, the effect being that the heavy gold settles down in the grooves while the sand passes off with the water over the tail of the sluice. The rakes also—practically covering, as they do, the upper half of the sluice—serve to protect the deposited gold.

When a sufficient quantity of gold or gold-bearing sand has been collected in this way the dredging is stopped, the sluice altered into the position shown by the dotted lines, the rakes are lifted, and the material deposited in the flutings is raked out and washed down a pipe into the laboratory for subsequent treatment. After working for some five days with a dredger of this class, raising about 1,500 tons of stuff per day, it is found that the concentrated gold-bearing material taken off from the sluice into the laboratory amounts to but about 4 cubic yards. Altogether the machine is one which has been well designed to carry out a large part of the work of concentrating alluvial gold-bearing material with a minimum amount of manual labor. Perhaps with a machine something like this we might get something out of our own river beds. The plan differs somewhat from any we have tried, for we have treated the whole bulk of the material, while this machine gets rid of a good deal at once.

Personal.

MR. JOHN. T. EVANS, the assayer and chemist of this city, is quite seriously ill with inflammation of the bowels.

JAS. W. MICHAEL has sold his interest in the Jim Blaine mine in the White Hills, A. T., to California parties for $1,000.

ED. HUME has taken a position as superintendent of development work in the Parker mine on Muletown mountain, Shasta Co.

THOMAS STEEN has struck a four foot vein of high-grade ore in his tunnel on the Jennie mine in Weaver district, Arizona.

D. B. LYMAN, Superintendent of the Con. California and Virginia mine, who has been at Santa Cruz for a short time, has returned to the Comstock.

MR. AUG. J. BOWIE, the mining and electrical engineer, author of "Hydraulic Mining in California" has gone to Cripple Creek, Colorado, on mining business.

THE State Mining Bureau has sent to Sacramento about two tons of mineral and ore specimens and over a dozen large photographic views of early California mining scenes, to be used in the historical exhibition in the State fair.

WALTER BROOKS, a mining man left on the last steamer for Mexico to assume the superintendency of the Theresa Mining Company's plant at Rosario, vice N. Nichols. He was accompanied by Captain Stockmeyer, one of the directors.

ALEXANDER MCCAW, Superintendent of the Integra, Quicksilver Mining Co., of Trinity Co., has made arrangements with Holt & Gregg to burn 700,000 brick on the company's ground. This brick will be used for the furnaces. The mine is in the Altoona quicksilver belt.

R. I. DUNN, of the California State Mining Bureau, returned last week to Yreka, from a trip to the Salmon River country. Mr. Dunn is now visiting Humbug and Klamath river in the Honolulu district, with intention of going to Henley, Siskiyou mountain and Upper Klamath mining districts.

RICHARD BRADLEY, Secretary of the Cortez Mining Company, informs the Austin *Advocate* that at present there are 15 men employed in and about the mine prospecting, but not extracting any ore. The report that the mill was to start soon is a mistake. It will remain closed down until silver advances.

A. J. ROULSTONE, of East Oakland, metallurgist, left last week for Stoddard, Arizona, to take charge of the smelting department of the Agua Fria Copper Company, a New York corporation, in which U. S. Senator J. P. Jones is largely interested. Mr. Roulstone has a well-earned reputation of being a skilled and experienced copper expert.

IT has been decided after consultation between the superintendents of the Savage and Norcross companies that each company will continue to work through its own shaft, instead of one, as heretofore contemplated. Considerable prospecting is being carried on in these two mines, and the management desire to push it ahead as rapidly as possible.

THERE are 3,194 men employed in the collieries of Vancouver Island, British Columbia, and the output for 1891 was 1,029,097 tons, compared with 678,140 tons for the previous year. During the thirty-three years ending December 31, 1891, £10 622,625 worth of gold was yielded in the province. The want of facilities for shipping ores has retarded the progress of the mining districts.

MR. B. L. MCLAIN, who arrived from Spring City last week, tells the Winnemucca Silver State that the experimental test made with the cyanide process has proved satisfactory, and works for the reduction of Paradise tailings are fast approaching completion. He expects to handle the tailings for about $1 50 per ton. There are about 3000 tons of tailings on the ground, which will give the process a very practical test.

W. E. DENNISON has sued E. W. Chapman for 12,500 shares of stock in the Taylor mine in El Dorado county, or for $62 500 claimed to be their value. He also demands $2500, alleged to be due on account of his salary as superintendent of the mine. Dennison claims the shares of stock under a contract as compensation for certain negotiations by which the defendant acquired 50,000 shares of stock from E. S. Chester and W. E. Straut, who were the original owners of the mining propeety.

Mr. A. J. COLQUHOUN, representing that very influential and wealthy corporation, the Gold and Silver Recovery Syndicate of Glasgow, Scotland, of which so much has lately been heard, has decided to make Golden his headquarters during the few weeks he will be in British Columbia. The chief object in doing this is the fact that the town is on the main line of the C. P. Railway, central to all the mining camps of East Kootenay and more easily reached by rail or boat from those of any other district than the many towns west of us.

Mechanical Improvement.

The careful observer who looks back a few years cannot but realize the great changes that have been made in that time, not only in the art of wood-working, but in the machinery used for that purpose; that the earlier machines invented and designed for that purpose were in many cases rude, as compared with modern machinery, and, while they answered the purpose for the time, yet in comparison with modern machinery they were the basis only upon which the latter are constructed.

In building the first machines for planing, the principal idea of the inventor was to construct a device for reducing lumber to a uniform thickness, with less labor than performing the same by hand. Various devices were attempted in England for that purpose before the rotary cutterhead was introduced. The first machines had nothing in the way of an automatic feed. The stuff was pushed over a table by hand, much in the same manner as the modern buzz planer or jointing machine, yet it established the fact that rotary cutters could be used for that purpose.

There is nothing to show that any attempts were made to introduce an automatic feed with success until William Woodworth made his invention, which was patented in this country in the year 1828. There is no doubt but Woodworth was the first in this country at least to combine with a rotary cutter a positive automatic feed; and from the fact that it was able to plane one side of a board, and reduce it to a uniform thickness by an automatic feed, it was not only considered one of the wonders of the age, but intelligent men were found who predicted that it was destined, if brought into general use, to ruin the trade of the carpenters.

Although William Woodworth is generally credited with the invention of the planingmachine which still bears his name, such was not really the case, for the rotary cutterhead, which is the most important part, had long been in use and was well known in England, yet this formed the true basis of his invention, which was simply the use of an old and well-known device in combination with another. The claim in his original invention shows this to be true. It says: "I claim the combination of the feedingrolls with rotary cutters, etc." Therefore, the original invention was simply a combination of two devices, which produced a new result, and the first machine was simply intended to plane one side of a board and at the same time reduce it to a uniform thickness. The addition of the matchers was another invention of which the original machine formed the basis. They were not added till some time after his first machine was in successful operation. Then a patent was granted in which the first claim was repeated and another one added covering the use of the side-cutters, still in combination with the feedingrollers, which constitute an automatic feed.

The improvements upon the original machine during the life of the original patent and its several extensions were few, from the fact that the patent was controlled by a monopoly, which effectually shut out everything in the way of improvements. Not until after the year 1856, when the patent finally expired and became public property, were any improvements to speak of added. The present modern planingmachine with all its improvements, which has brought it to its present state of perfection and efficiency, were made since that time. But these improvements have not been made by any one man; different manufacturers have studied the wants and requirements of woodworkers, and have each added improvements until it would appear that perfection was nearly attained; and if William Woodworth could come back to this earth and look upon the modern planer and matcher, feeding the lumber at the rate of from 80 to 100 lineal feet per minute, he would scarcely recognize this as the results of his invention of 65 years ago.

What is true of the planing-machine is equally true of all other machines used in modern wood-working establishments. Skilled workmen have grown with these improvements, and the operator of 40 or 50 years ago, although he may have been considered at that time a skillful one, would be but little, if any, better in the mill of to-day than a green hand.

It is, therefore, well that these improvements have come gradually, for if it were possible that the first planer or molding machine had possessed all the improvements of the modern machine, it is doubtful whether they would have been successfully introduced, for the reason that much of the work performed by the modern machine was not called for at that time, and it is doubtful if men of sufficient skill could have been found to operate them. The band-sawmill is a practical illustration: Although the bandsaw has been in use in France for many years, and was, comparatively speaking, an old device, yet the failure of many of the first bandmills in this country was not so much from certain imperfections (since corrected) as from the lack of skillful operators to run them. Even among the best circular-sawfilers and sawyers, very few were found able to successfully manage a bandsaw until they had made themselves familiar with the new practice.

The circular sawmill passed through the same ordeal upon its first introduction. While many expert filers and sawyers of the uprightsaw could be found, it was several years before a sufficient number of men were found who could successfully run a circularmill and keep the saws in perfect order. But as soon as a sufficient number of sawyers became educated in its use, the circularsawmill entirely superseded the upright. The modern gangmill is about the only style of reciprocating saw at present in use, and only the fact that much thinner saws are used, and thereby a saving in lumber effected, has kept the gangmill from disappearing long ago.

Now that the band sawmill has become a success, and skillful men are fast being educated in its practical use, there is no doubt but history will repeat itself, and both the circular and gang will in time give way to their successful rival for the manufacture of lumber from the log. The advantages in economy in favor of the bandmill are fast becoming apparent. The thin saws used by the band can never be aproached by the circular. While the average circular makes a kerf at least one-fourth inch, the band only requires about one-half that amount. The saving of one-eighth inch in the saw kerf amounts to enough to make a great difference in the product of a days sawing. Still, the success of the bandmill will depend upon the skill and dexterity of the filer and sawyer. The time is approaching fast when the faithful old circular, like many other devices, must give way to a successful rival.—Homo, in The Wood-Worker.

Coast Industrial Notes.

THE Wieland Brewery Co., of this city, are building an ice storage house in Tucson, Arizona.

OF the 580 men employed at Mare Island Navy Yard, 200 are at work on the monitor Monadnock.

THE sugar factory at Alvarado will commence handling beets about the end of September. The growers are fearing an early and wet winter.

THE Veterans' Home at Yountville is now lighted with gas made with the patented apparatus manufactured by the Badlam Bros. of this city.

A CHICAGO syndicate is investigating the country about Shasta with the intention of establishing a paper manufactory to be run by water power.

STOCKTON is to have the largest macaroni factory on the coast. It is to be built by a San Francisco capitalist, and the intention is to supply the Pacific slope with the product.

PHIL DECKER, one of the proprietors of the Portland Smelting and Refining Works, was in Redding last week. His business is buying ore and he wishes to purchase ores of Shasta county.

A PLAN is being arranged at Santa Rosa to build a boulevard between that place and Petaluma. If the new road is opened, the long-talked of electric road between the two places will undoubtedly be constructed.

THE people of the State of California have the sum of $198,646 411.08 in the several banks of the State. The savings banks hold $127,312,088.41, the commercial banks $53,247.262.73, and the national banks $16,669,177.83.

WORK at Oneta's marble quarry, Amador county, is progressing. They are making preparations and excavating a foundation for a derrick and mill. The company propose to ship the marble in a finished state and small blocks.

THE cruiser Charleston is undergoing an overhauling at Mare Island Navy Yard and is still in the dry dock. The boilers are being retubed and the smokestack strengthened, and a large force of men is at work on the general repairs.

WORD has been received from Mint Director Leech that the Carson Mint would be run to its full capacity, and that superintendent T. R. Hofer might make any requisition necessary. It livened up Carson considerably, as a heavy deposit of bullion is now on band.

IN the township round about Mission San Jose, Niles and Alvarado, there are four great industries—fruit-growing, wine-making, a beet-sugar factory and extensive salt works. The section also sends about $100,000 worth of early vegetables each year to the city markets.

FREIGHT shipments from Stockton and the landings along the river are so heavy that the Navigation Company has put another boat on the route carrying passengers and freight. Two steamers leave Stockton for San Francisco every day and every other day three steamers are sent out.

A TUNNEL 1140 feet long on the Fort Bragg logging railroad has just been completed. It connects Redding creek with Noyo river, where the Fort Bragg Redwood Company will carry on logging operations this season. The tunnel opens up a fine body of timber miles in extent, where the ax has never been struck except for ties.

W. A. MERRALLS, a mining engineer of Los Angeles, claims to have discovered a solder for aluminum, a process which has in vain been sought for during the past 30 years. The invention will be of great value in dentistry, aluminum being admittedly far superior to rubber or gold in such work. The solder, it is claimed, is also applicable to German silver.

THE cannery at Whittier, Los Angeles county, has already canned and shipped 200,000 cans of apricots. It is now working on peaches, pears, apples and prunes, and the output is 10,000 cans daily and drying 20,000 pounds daily. This week the canning of tomatoes will be begun, and 350 tons of tomatoes have been engaged. Two hundred people are steadily engaged, and no Chinese are to be found on the premises.

AT the annual meeting of the Judson Manufacturing Company, the following named were elected directors for the ensuing term: Egbert Judson, H. E. Bothin, L. P. Drexler, G. B. Cushing, C. E. Green, N. Ohlandt and P. A. Wagner. The board met and organized by electing Egbert Judson, president; H. E. Bothin, vice-president; John Gilson, secretary; Wells, Fargo & Co.'s bank, treasurer; and P. A. Wagner, general manager.

IN September, 1891, the Board of Supervisors of Alameda county granted a franchise to F. Chappellet, H. M. Miller, N. C. Ames and Herman de Laguna to operate an electric road from Haywards to the county line of Santa Clara county. These gentlemen this week sent a communication to the Supervisors, wherein they say that they now desire to commence work on the road, and ask the board to designate the exact location upon the county roads where the tracks shall be laid.

THE big lumber raft at Fort Bragg did not start down the coast on schedule time, for its launch was unsuccessful. The pointed end slid down off the cradle and buried itself in the sand so deeply that it could not be extricated. The tides being unfavorable, no further effort will be made to tow the raft off till September 6th or 7th, when a full-moon tide occurs. It takes 15 or 16 feet of water to float the raft, and 16 feet is about the maximum depth in that part of the Fort Bragg harbor at flood tide, so that it will be a pretty near thing. The raft is 356 feet long and contains about $75,000 worth of lumber.

CONTRACTS were signed this week at Bakersfield, Kern Co., guaranteeing the construction of the East Branch Canal. This canal company has purchased water from the Kern Island Canal and Irrigation Company, and the new canal will divert water from the Kern Island Canal immediately northwest of east Bakersfield. The new waterway will run through the streets of Bakersfield and to the southeast for 25 miles. It will bring under irrigation 30,000 acres of choice fruit lands, which have previously been idle for lack of water. The new canal is under contract to be completed by January 1, 1893, and the charges will be $1.50 per acre per year.

THE Chino beet sugar factory, Los Angeles Co., has turned out this year 2,870,059 pounds of sugar. Of this quantity 516,000 pounds was from the syrups of 1891, and the balance was from this year's beet crop, 2,352,059 pounds. About one-half of the entire quantity is crude sugar, which will run between 80 or 90 per cent sugar. Upon this the Government pays 1¾ cents per pound bounty. The other one-half is raw sugar that has gone through a centrifugal machine. From present indications, this year's beet crop will amount to about 50,000 tons. For every ton the grower will receive on an average $4.50. This year 40,000 acres have been planted to sugar beets, as against 2700 last year. This year the beets run about 15 per cent sugar, as against 13 per cent last year.

AN overstocked market has placed on foot a scheme to control the lumber interests of the Pacific coast, with a view to bracing up the trade. No definite plan has been adopted yet, but propositions have been submitted to mill-owners from Alaska to southern California. The combine proposes to run the lumber business of the coast in the matter of limiting the output which has been such as to drug the market and bring about the present dull condition of trade. Puget Sound mills have swamped the yards here and elsewhere, and something must be done to revive trade. If the scheme goes through it will be the largest trust of the kind on record. The plan is to bring the mills of British Columbia, Puget Sound and Gray's Harbor into the combine and subsidize the smaller concerns on the coast.

THE new building for the mechanical and electrical engineering department at the University of California will be commenced shortly. The bids for the work were received by the Regents this week. The lowest bid for grading, brickwork, granite work, cast and wrought iron work, and sewering was that of Robert Mitchell of San Francisco, who bid $38,323. The carpenter work was awarded to Alexander L. Campbell, of San Francisco, whose bid was $14,318. For tinning and galvanized iron work the bid of Joseph Guilfoy, of San Francisco, was the lowest, being $3989. William Snook & Son, of San Francisco were awarded the plumbing contract for $1790. The painting contract was given to F. L. Holland, of Oakland, for $848. The total amount of the contracts is $59,268. The contracts will be made out for the successful bidders at once.

Mining Briefs.

IN the creek at Granite Basin, Plumas county, Charles Casey and wife are working a placer claim with excellent results. Most of their pay is in coarse gold, and they take out on an average about $6 a day apiece, Mrs. Casey working alongside of her husband, sharing in the work as well as the profits.

AT the District Fair held in Nevada City, the first premium of $50 for ores was given to the Champion Mining Co; second premium, $25, to the Mountaineer Mining Co. For the best display of minerals, the Peabody Mining Co. received an award of $50; and M. C. Taylor was awarded $25 for a display of iron ores.

IN several localities between Pinal and Gila counties, Arizona, the copper ore found is argentiferous. It is so in Mineral Creek; in Globe, the Buffalo has sufficient silver to produce bullion yielding 45 ounces per ton. In the Caliuro mountains, and within a few miles from Globe, ore is found that has noticeable quantities of gold.

THE Salt Lake *Journal* has it on good and reliable authority that the purchase of the Pioche Consolidated Mining and Smelting Company's property by the Kansas City Consolidated S. & R. Co. has been consummated, and that the property has been turned over to representatives of the Kansas City company now in Pioche. The transfer includes all of the mines, smelter, Jackrabbit railroad and other property owned by the Pioche company.

EARLY RISING NOT ALWAYS A VIRTUE.—Thousands of people have no choice whatever about their hour of rising in the morning. Later or earlier, that hour is fixed for them by the requirements of the office, the shop, or the classroom; by the timetable of the railroad; by the arbitration of their employers or the necessity of their employes. But in the cases manifold where personal liberty is enjoyed, it should not be thoughtlessly restricted simply because of the domestic tradition that early rising deserves praise and late rising blame. Breakfast may oftenbe a movable feast without materially disturbing the routine of an orderly housekeeping day. Invalids, mothers whose rest has been broken by teething babies, and, above all, rapidly growing children, should have their sleep out. Nature demands this, and violence is done to her when sleepy people are rudely aroused from their beds. Early to bedis the single safe prescription to insure early to rise. We need not repeat it over and over to our hurrying, anxious, toiling American men and women; Rest, rest, and again, rest. Do not think time ill spent that is spent in repairing the ravages of our wellnigh incessant activity.—Harper's Bazar.

The Cyanide Process.

The Chemical views of M. T., Etc.

TO THE EDITOR:—My fighting days are drawing to a close, the turmoil of battle is less grateful to me than it once was, and I should hardly have cared to cross swords with your correspondent but that he professes to have "studied carefully" his subject, and proposes to "help those interested to understand it"—a purpose which, it seems to me, his article is by no means likely to fulfill, it being, I believe, better calculated to lead to their misunderstanding.

M. T. begins by accepting as truth the claim that a weak solution of potassium cyanide has what MacArthur calls a selective affinity for gold and silver in base ores, dissolving them "by preference, leaving the base metals untouched." This, in my view, is an untenable conclusion from inadequate premises. To the unchemical reader, it may appear to be sustained by the fact that in practice the gold and silver are (more or less) dissolved, leaving associated iron pyrites, galena and some other base metal *compounds* unacted on. I might here ask why it is that the custom mill in Shasta county will not receive base ores carrying much copper or antimony, but it is not necessary to my purpose. I italicize the word compounds because it has profound significance to the question under consideration.

It is my belief that the *inventor* of this "selective affinity" never intended it for scientific use. I opine that its purpose was something very different, and analogous to that of the ounce of ammonium carbonate to a pound of potassium cyanide of the Simpson patent—(MINING AND SCIENTIFIC PRESS, July 2, 1892.) The real reason for the apparent preference, to a certain extent, of the precious metals in the usual tests is that the gold and silver are in the metallic state, or the silver is in the form of chloride or other compound which is easily soluble in the liquid, and as copper sulphuret is also soluble in it, "selective affinity" is observed to fail when that substance is present. That the failure would be more manifest in the presence of easily-soluble base compounds, such as copper or iron sulphates, etc., is certain, and is the very reason for the use of lime or other alkali in the treatment of ores containing such substances.

But a fair test of this pretense of a selective affinity can only be made by treating a mixture of precious and base metals in the metallic state. Suppose we should take gold, silver, copper, lead, iron, bismuth, antimony, arsenic and zinc, all in the metallic condition and powdered, and treat the mixture with a solution of potassium cyanide, strong or weak, within feasible working limits, what would result? As to the iron, I believe that would not be affected; the lead might also resist. How the other base metals would behave, except the last, I cannot say; but the zinc at least would receive the benefit of selective affinity, and if present in sufficient quantity to saturate the liquid, neither gold nor silver would be found in solution. It is very probable that, in the absence of zinc in such proportion, some other base metal would have a similar effect. The mildest verdict that can be given on the claim of a selective affinity for precious metal is, *not proven*.

"All substances bear certain electrical * * * * *relations* to each other." Correct; but I italicize relations, because the qualities are *only* relative, so far as known. We cannot affirm that zinc is absolutely positive, nor that carbon is absolutely negative, for zinc is negative to sodium and carbon is positive to sulphur (under ordinary conditions). We could not form even an idea of the quality of a single substance in this regard. This seems to have been lost sight of by M. T. when he wrote "Cyanide of potassium is composed of two negatives," but I am always willing to give credit for what is meant, which I take to be that cyanogen is negative to potassium; but the assertion that "the potassium causes it to seek out the most negative metals and unite with them by preference" inspires me with profound astonishment. Is M. T. aware that, in a cyanide solution, gold at least is positive to mercury, and is not precipitated by iron? What warrant is there for calling a solution of potassium cyanide "positive," and what for the statement that the positive component can cause the negative component to unite with those metals which are least positive to the latter, rather than with those which are most so? Is not the real reason of the apparent selection that the base metals in the ore are already combined with something which the cyanogen cannot displace? I ask this in good faith, for information, for I do not know what base metals (in the metallic state) can or cannot be dissolved by aqueous potassium cyanide. Even zinc, though it replaces precious metals in the solution, and though it dissolves independently of such replacement when in contact with iron, etc., forming an electro-chemical couple, may, perhaps, if pure and alone, refuse to dissolve in solution of potassium cyanide free from caustic.

The statement that "the gold and silver unite with the cyanogen without displacing the potassium" will surprise those chemists who have accepted the formula $K\,Ag\,(C\,N)_2$ for the compound of silver which exists in the solution, and who believe with Prince Bagration (*J. fr. Chem. XXXI*, 367) that metallic gold * * dissolves in aqueous cyanide of potassium * * forming aurocyanide of potassium and caustic potash.

$$Au_2 + 4\,K\,Cy + O = 2\,K\,Au\,Cy_2 + K_2\,O.$$

The fact is, the potassium will not, under the conditions supposed, give its cyanogen to the metal without a "valuable consideration" any more than M. T. would give me his gold on such terms; it must have something in exchange, and the only acceptable element available is oxygen, which it obligingly accepts. According to Elsner (*ibid XXXVII*, 333), the oxygen is derived from the air, which dissolves in the solution, or from oxycompounds formed in that by air, for he says: "The action requires access of air." I am aware that Mr. MacArthur has doubted this, but that gentleman's experiments, as related by himself, fall very far short of sustaining his view. If, however, the oxygen is derived from another source, it must be from the decomposition of water.

"It is proper to state that different solutions change the relative positions * * of some of the principal metals" in the electro-chemical series, says M. T. Correct again; and for this reason the series quoted from Gore is of no use in considering the effects of the solution in question, though it does afford an illustration of the general truth, and, as a further illustration, the following series, also on "high authority," may be instructive, albeit the first, which I presume to mean in air, does not agree with that of Gore:

+K. Na. Li. Ba. Ca. Mg. Al. Mn. Zn Fe. Ni. Co. Pb. Sn. Bi. Cu. Ag. Hg. Pt. Au. H. Si. Sb. C. B. C_2. As. P. I. B_2. Cl. Fl. N. S. O.—*Fechter*.

+K. Na. Mg. Zn. Fe. Al. Pb. Sn. Bi. Cu. Ag. Hg. Pt. Au. H. Sb. C. Te. P. Se. I. Br. Cl. N. S. Fl. O —*Gore v. T. M.*

It will be seen that there are discrepancies, but the conditions may have differed; we have also:

In water, + Zn. Pb. Sn. Fe. Sb. Bi. Cu. Ag. Au.—*Fechner*.

In dilute sulphuric acid, one volume each water and acid:
+Zn. Cd. Po. Sn. Fe. Al. Ni. Sb. Bi. Cu. Ag. Au. Pt.—*Poggendorf*.

In one volume strong nitric acid and seven volumes water:
+Zn. Cd. Pb. Sn. Fe. Ni. Bi. Sb. Cu. Hg. Ag. Au. Pt.—*Faraday*.

In one volume hydrochloric acid to one volume water:
+Zn. Cd. Sn. Pb. Fe. Cu. Bi. Ni. Ag. Au. Pt. Graphite. Soeroxide of manganese.—*Faraday*.

In solution of sal ammoniac:
+Zo. Cd. Pb. Sn. Fe. Bi. Sb. Ag. Hg. Au. Pt. Graphite.—*Pogg*.

In solution of yellow sulphate of potassa. (Probably a misprint for yellow sulphide or yellow prussiate of potassa):
+Zn. Cu. Cd. Sn. Ag. Sb. Pb. Bi. Ni. Fe.—*Faraday*.

In solution potassium cyanide:
+Au. Hg.—*Wm. Skey*.

These determinations are not very recent, and it must be considered that a slight impurity in a substance might cause error; also, not only different liquids but different temperatures give different results.

If, as M. T. says, "Cyanogen associated with potassium is of a positive character and prefers negatives," how is it that it prefers zinc to gold and silver? Zinc is constantly positive to the precious metals in all of the above series, unless we are to except the last, which must then be written, + Hg. Au. Zn.—with Cu. somewhere on the positive side of zinc, and we shall have the interesting spectacle of the cyanogen "preferring" the metal which is least opposed to it electro-chemically, instead of the reverse as usual.

While on this prolific subject of discussion, the cyanide process, I take the opportunity of remarking that, according to the *E. & M. Jl.*, it has failed at the Needles. It has also failed in giving satisfaction at the Gold Blossom mine in Placer county, and I hear of another case in which they say they extract the gold from the ore, but do not find it in their pockets—do not find it anywhere, in fact. I do not know whether these failures are due to defects in the process or to the incompetence of the operators, but I insist that the gold extracted from the ore is somewhere, and it is the duty of the chemist in charge to find out where. By the way, though, perhaps they have no *chemist*, but only a "practical man!"

Those who have precipitated gold from a cyanide solution on zinc, in a test tube, may have observed that a white powder was produced. I have seen it, and the chemist at the Calumet works, since deceased, mentioned it in a letter. I did not pay much attention to it at the time. Lately, I have seen a lump of dried precipitated gold, mixed with zinc shavings, which contained a considerable proportion of a white substance. In melting the gold in a black-lead pot, volatilizing the zinc, a very large loss of gold has been observed, as I am informed. Finally, it is stated in Watts' Dictionary of Chemistry, Vol. II, that a solution of aurocyanide of potassium gives a white precipitate on the addition of a zinc salt. Possibly these facts may afford a clew to the whereabouts of the missing gold. On the whole, I think the present method of attempting the recovery of the gold is "a lame and impotent conclusion" of the cyanide process, and if M. T., or any other man, will find a better, he will remove a serious obstacle to its success.

In the meantime, I suggest that the solution may be used until it shall be saturated, or nearly so, with gold, and then allowed to *stand* in contact with zinc until all of the gold is precipitated in one form or other, then decanted through a filter and either reinforced and used again or thrown away, as may be found best. Or, the gold may be precipitated by electrolysis; it may be necessary to provide for the neutralization of hydrocyanic acid, which can probably be done by adding caustic potash. In this way the solution would be regenerated, which might pay for the electricity.

I should like to know if there is, anywhere in the United States, a place where the process is being successfully operated by parties who are entirely disinterested as to its adoption by others, and if there is any place in, or not too far from California, where the process is in regular, continuous and successful operation, not only *extracting* a satisfactory percentage of the gold from the rock, but also converting it into money. I am willing, even though the owners may be interested in selling rights or licenses, to go and investigate to the best of my ability, and report results in the interest of metallurgy, of the MINING AND SCIENTIFIC PRESS, and of my own great glorification and enlightenment. The proprietors of this paper promise me their assistance in doing this if the opportunity should offer and if full facilities be granted.

To prevent misunderstanding, I remark that this offer does not apply to operations which are not satisfactorily successful; those who need a *doctor* must pay for one.

C. H. AARON.

Refining Copper.

Mr. G. W. Stead of Germantown, Philadelphia, was in the city yesterday and gave the *Montana Mining Journal* an account of the manner of refining copper by electricity. The only plants using the process, which Mr. Stead first adopted in this country, is one at Pawtucket, Rhode Island, and the one now being constructed at Great Falls by the Boston and Montana Company. The process is similar to that of electroplating, which has long been employed in treating plates for printers' uses, but the solutions are different. The copper is put into cells with proper solutions, which forms the anode of a circuit, and the refined copper is deposited on a sheet of copper in another cell, which is the cathode of the circuit.

First the matte has to be refined in converter, so that all the iron, antimony, and every trace of arsenic is removed from it, when it is cast into bars of the proper shape and size for the cells into which it is placed. When the circuit is established, a steady current is maintained by means of a dynamo, and every three days the bar is lifted and the slimes which have accumulated upon it are removed and it is again placed in the cell. This is repeated until the copper is all dissolved, which takes about 35 days. The deposited copper is as pure as it is possible to make it, being within a very small fraction of 1000 fine. The estimated cost of treating a ton of copper by this process is $5 in Rhode Island. At Great Falls the cost will be less, for there the melted matte will be received into converters, and the cost of remelting the matte will be saved. This cost can be further lessened by increasing the facilities for handling the product in various stages. Four men during the day and one at night are sufficient to take care of a 10-ton plant, outside of the engineers and firemen, if steam is used to generate electricity.

The object of refining copper by this process is to make the copper absolutely pure, and save at the same time the gold and silver in the matte. The increased value of the refined copper will pay for the cost of refining, and the gold and silver extracted will be almost or quite clear profit. The refiners in purchasing matte only allow the producer of the matte the silver over 30 ounces. This is about 50 ounces of silver to a ton of refined copper. If a company operating such a plant as this would pay the same price for the matte, the whole of the silver and gold would be saved and would constitute the profit of the owners of the plant. If the amount refined was ten tons, the profit would be $500 a day. The plant would cost, ready to run, about $125 000. The money for the stock could be turned over every 35 days, and the gold and silver would be gathered every day, if it was desirable. As the slimes are gathered, they can be reduced as fast as they accumulate.

The fact that the Boston and Montana Company have invested a large amount of money in such a plant, after having tried it thoroughly in the Pawtucket refinery, is proof that the process is no experiment. It was first tried in Germany, and has been in operation in this country about ten years. There is no reason why such a refinery, or several of them, should not be set up in Butte. In fact, it would no doubt be profitable for each smelter in Butte to have a plant sufficient to refine the copper produced therein, for the cost of remelting the matte would be saved. On the amount of copper produced in the State last year the saving would be nearly three million dollars.

It seems to us that this method of refining copper has such merit that our capitalists and smelting men should look into it. Copper can be refined in Montana as cheaply as elsewhere. In fact, it can be refined more cheaply, if such a plant was operated in conjunction with our smelters, for the cost of smelting the matte would be saved. Such a plant should be erected at once, for the saving would be greater than the present profits of the smelters.

Heat at the Center of the Earth.

The workmen in the deepest mines of Europe, says a writer in *Goldwaithe's Magazine*, swelter in almost intolerable heat, and yet they never penetrate over .007 part of the distance from the surface to the center of the earth. In the lower levels of some of the Comstock mines the men fought scalding water, and could labor only three or four hours at a time until the Sutro tunnel pierced the mines and drew off some of the terrible heat, which had stood at 120 degrees.

The deepest boring ever made, that at Sperenberg, near Berlin, penetrates only 4172 feet about 1000 feet deeper than the famous artesian well at St. Louis. While borings and mines reveal to us only a few secrets relating solely to the temperature and constitution of the earth for a few thousand feet below the surface, we are able by means of volcanoes to form some notion of what is going on at a greater depth. There have been many theories about the causes of volcanoes, but it is now generally held that, though they are produced by the intense heat of the interior of the earth, they are not directly connected with the molten mass that lies many miles below the immediate sources of volcanic energy. Everybody knows that many rocks are formed on the floor of the ocean, and it has been found that a twentieth to a seventeenth of their weight is made up of imprisoned water.

Now, these rocks are hurled in time under overlying strata, which serve as a blanket to keep the enormous heat of the interior. This heat turns the water into superheated steam, which melts the hardest rock, and when the steam finds a fissure in the rock above it, it breaks through to the surface with terrific energy, and we have a volcano. We find that these outpourings, which have lain for countless ages many thousands of feet below the surface are well adapted to serve the purposes of man. Many a vineyard flourishes on the volcanic ashes from Vesuvius, and volcanic mud has clothed the hills of New Zealand with fine forests and its plains with luxuriant verdure. The most wonderful display of the results of volcanic energy is seen in the northwestern corners of our own land, a region of lofty forests and of great fertility.

Mechanical Progress.

Tungsten Steel.

Many users of tool-steel are not aware that Mushet's special steel owes its property of becoming and remaining hard when cold, without the necessity for any hardening process, to the fact that it is an alloy of tungsten and ordinary carbon-steel. Its extreme strength and hardness are due, principally, to the large percentage of tungsten, which it is possible to incorporate as a perfect alloy. One of the chief advaotages of its use for tools is that, should they be heated by friction as is so often the case, either in grinding or cutting, it does not impair their hardness in the least, whereas a tool of ordinary carbon-steel would, under the same conditions, require to go to the tooldresser for rehardening. In all other respects there are many brands of the tool-steel which are fully equal to the Mushet. It is not for tool purposes alone, however, that this property of tungsten is valuable. Its cost is low enough to admit of its use with the lower grades of steel, and the degree of hardness can be graduated to suit any desired purpose, from the very hardest to the lowest temper. The requisite percentage of tungsten necessary to give the required temper can be calculated as accurately as can the carbon for ordinary steel. As an example of the lowest temper, that of a hot-coiled spiral car-spring may be cited. By careful comparative tests with a carbon-steel spring made of precisely the same mixture as the other, but without the tungsten, its carrying capacity was about 20 per cent greater, while its resilience or resistance to permanent set was about the same. After testing, it was placed in the tempering furnace used for the ordinary springs, and after heating to full red heat, was left in the furnace and allowed to cool with the latter. A more perfect annealing process could hardly be devised, as it required about 36 hours to cool it sufficiently to handle. It was then retested, and, strange to say, showed an increased carrying capacity of about five per cent, and no further permanent set. Samples of the same steel, but with varying perceotages of tungsten, were tried for different purposes, and were, in all cases, satisfactory. A chipping chisel was forged from it and heated to full-red after dressing and grinding. After cooling naturally, it was tested on cast and wrought-iron, steel and brass, and stood the roughest possible usage without injury. While these various tests were eminently successful they were barren of practical results, as the company io whose interest they were made discontinued business shortly after. As the difficulties of its manufacture are no greater than are experienced in ordinary steelmaking, and the cost of tungsten oxide being within the commercial limit, it seems rather remarkable that the use of this alloy should be confined to the one purpose met by the Mushet brand. The percentages required for given degrees of temper, also those of manganese and carbon giving the best results, would, of course, have to be determined by careful and systematic experimeots. There can be no question as to the advantages of a steel having its temper independent of any and all conditions to which it could be subjected. In connection with the tests alluded to a series of tensile tests on a Fairbanks testing-machine were made. The average breaking-strain was about 112,000 pounds, while the elongation was somewhat less than that of carbon-steel. —Iron.

LIMITS OF STEAM EXPANSION.—The following extract from a circular issued by a firm of well-known builders of a high-speed engine said to run satisfactorily at 700 revolutions per mioute, and to develop 200 horse power, is interesting, since it attempts to confioe the use of double and triple expansion to certain limits: If the boiler pressure always exceeds 70 pounds, it is worth while to use a compound engine; if as high as 150 pounds, a triple expansion engine. If the engine exhausts into a vacuum, the corresponding pressure will be about one-fourth lower. The exient to which the steam may be expanded with advantage depends upon the boiler pressure. If the expansion is carried to more than a certain number of volumes, it is advantageous to divide it into two stages, *i. e.*, to expand partly in a high pressure or small cylinder or cylinders and partly in a low-pressure or large cylioder or cylinders. With still greater expansioo, it is worth while to expand in three stages, *i. e.*, in three successive cylinders of increasing diameter, and so on. But, although there are great practical and economic advantages in the system of expaosion in successive stages, there is no essential difference in principle between expanding, say eight times, in a series of three cylinders, with comparatively late cut-off in the first or smallest one, and expanding eight times in the largest of the three only, with the steam admitted to it direct and cut off at one-eighth stroke.

Lathe Testing.

The method of lathe testing, which consists in bringing the centers of the lathe together and sighting them, is of no value for even ordinary machine work. If the centers could be adjusted exactly in line by this method, when they are separated they may he found incorrect for any other distance.

It is practically impossible to turn a true cylinder between the centers of any lathe, however perfect; true cylinders can be produced by grinding only, the work being supported upon the centers.

The first operation in testing a lathe is to put the centers in line at a distance of from two to ten feet according to the size of the lathe. Place in the lathe a piece of shafting, stiff enough to support itself without springing; square up its end, and center it, taking care to have the centers drilled deep enough to prevent the lathe centers from bottoming. Insert a pin in the end of the shaft, so that it can be driven without the use of a lathe dog. With a sharp tool turn the head end of the shaft for a short distance. Then, without moving the tool, take the work out of the lathe run the tool carriage down to the tailstock, replace the work, and turn the opposite end of the shaft for a short distance. If the calipers show no variation in the size of the work at opposite ends of the shaft, the lathe is in line; if there is a difference, the tailstock must be set over until the tool, without further adjustmeot, turns the same diameter as it did at the opposite eod of the lathe. In making this test the tool should be set exactly level with the centers.

With the lathe adjusted to this extent, remove the turning tool and insert aoother having a very fine point. Run the carriage back, remove the live center, replace it with a stick three feet long fitted to the spiodle and firmly driven in the place of the center, run the carriage up and allow the fine-pointed tool to scratch the eod of the stick as it revolves; if it makes a point, the lathe is true. If the tool describes a small circle, the lathe is out of true, and the headstock must be readjusted by scraping the surfaces which bear upon the bed, to make the necessary correction. Remove the tool and run out the tail spindle; if the dead center goes into the point made by the tool, the lathe is true. If the center does not enter the point, the tailstock must be corrected by scraping, as io the case of the headstock. This method of testing is open to the objection that the stick may spring of its own weight. Lathe builders have special apparatus.—Optician.

Electricity in Railroad Shops.

A paper bearing the above title was read by C. A. Seeley recently before the Northwest Railroad Club. Among other things Mr. Seeley said: "One difficulty to be overcome in the use of small motors is their speed as compared with all machines used in iron working. One convenient way of overcoming this would be to mount the motor on a plate, on which standards would carry a shaft and pulley so arranged that the pulley would he in fraclional contact with the pulley on the armature. This counter pulley could be ten or more times the diameter of the oiher and have a grooved cone on one side, from which a round belt could be run to a grooved pulley on the machine to be driven. By a system of idlers, tension and direction could be given to the belt. The motor having a constant speed, the cone would permit chaoges of speed at the tool. Many forms of special tools could be devised in this connection.

"In the Crewe shops in England portable drills capable of drilling one inch holes io steel are in use which are electrically driven. The drill spindle is the arbor of a worm wheel, and a dynamo armature is on the shaft of the screw whicb works the wheel, and the whole apparatus—dynamo and all—weigh sixty-five pounds. Another application used in the same shop is a saw for cutting tubes out of locomotives. The saw arbor is also the arbor of the dynamo armature; and the saw is just large enough to enter the tube; the frame work carrying this is held up against the tube sheet by hand, an eccentric motion forces the saw through the tube on one side, and then by another motion the saw is carried around, completely severing the tuhe. The saw is then returned to the center and withdrawn, and the tube cao then drop down. The beauty of this operatioo lies in its celerity of cutting, and in the fact that the tube end is neatly cut off square and ready at once for scarfing for a new safe end.

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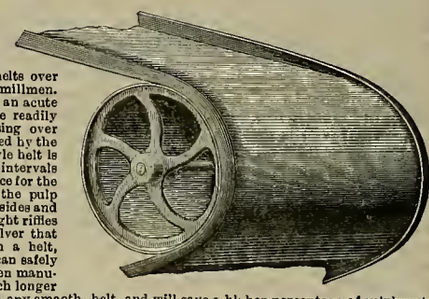

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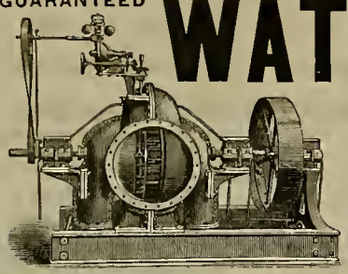

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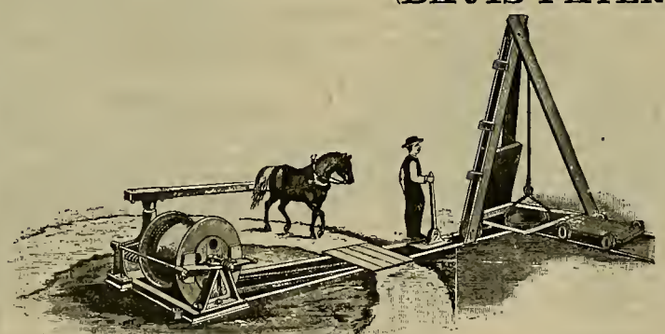

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Scientific Progress.

Water-Ram in Steam Pipes.

If steam be introduced below the surface of water contained in a large vessel, a bubble will be formed which will increase in size until its surface becomes sufficiently extended to condense the steam more rapidly than it can enter, when a partial vacuum will be created, the bubble will collapse, and the water, flowing in from all sides at a high velocity, will meet with a blow forming what is called a water-ram.

Such explosions occurring in the middle of the mass creates simply a series of sharp noises. But if steam be blown into a large inclined pipe full of water, it will rise by difference of gravity to the top of the pipe in the form of a bubble; and when condensation takes place, the water below the bubble will rush up to fill the vacuum, giving a blow directly against the side of the pipe. As the water recedes the bubble gets larger, and moves farther and farther up the pipe, the blow each time increasing in intensity, because the steam has passed a larger mass of water, which is forced forward by the incoming steam to fill the vacuum.

The maximum effect generally occurs at a closed end. Even if the water does not originally extend to the end of the pipe, if this be filled with steam which has bubbled through water on its way to that point, there may be sufficient cold metal to condense it; and when collapses take place the whole mass of water in the pipe is driven against the end, sometimes with sufficient force to rupture it.

A dangerous water-ram may be produced in a pipe filled with water, even if the end be open, should the pipe be crowned upward at any part of its length. A bubble will form at the top of the crown, and there collapsing, water will be forced in by atmospheric pressure from one end and by steam pressure from the other, and the meeting of the two columns may rupture the pipe. The same action can occur in a level pipe, but not in one which descends away from the entering steam, so that the latter is always above the water.

SPONTANEOUS COMBUSTION. — Spontaneous combustion is no doubt due, primarily, to the absorption by coal of the oxygen of the air. All kinds of coal, after being cut or broken, begin to absorb oxygen, the amount varying in volume according to the quality of the coal. The absorption of the oxygen raises the temperature of the coal, and this augments the rate at which the oxygen is taken in. Although the absorption of oxygen does not raise the temperature of the coal sufficiently high to cause combustion, the oxygen itself becomes chemically active, and in bituminous coal it combines with the contained hydrogen and carbon, thus further increasing the temperature. When such action takes place in the center of a heap of coal, a sufficient quantity of air may be supplied to cause spontaneous combustion. It is also claimed that pyrites in the coal play an important part in promoting combustion. The chemical change which the pyrites undergo, especially if there is a large percentage of that substance present, in some instances liberates sulphur, and as the temperature necessary to ignite sulphur is only 482° Fahrenheit, while in the case of cannel coal, which ignites at the lowest temperature among the several kinds, 698° Fahrenheit are required, it will be seen that, in consequence of the chemical change indicated, the actual temperature of ignition is really lowered 200 degrees in cannel coal. Pyrites also promote spontaneous combustion through the tendency of the coal to split up in small pieces, caused by expansion from oxidation, thus exposing fresh surfaces with a consequent increased absorption of oxygen. Coal cargo fires are more frequent in the tropics than in the higher latitudes, but the introduction of high steam pressures, with the consequent increase of bunker temperature, in connection with triple expansion engines, has had the same effect upon the bunker coals of steamships that the natural heat of the tropics has had upon coal cargoes. It has been said that the so-called ventilation which has from time to time been introduced in ships is one of the most prolific causes of spontaneous combustion.

THE ELECTRICAL PRODUCTION OF OZONE.—One use of ozone, on which Herr Frolicb lays special stress in a recent lecture, is the disinfection and sterilization of water. From recent experiments in the Siemens and Halske laboratory at Berlin, it appears that good results bave been attained in producing ozone on a commercial scale by means of the silent electric discharge. An apparatus now at work in the laboratory yields 2.4 mg. of ozone per second. Experiments are being made in supplying compressed ozone for technical use, and this has been accomplished with a pressure of nine atmospheres.

When Water Freezes.

Let us take our stand, says a contemporary, on the banks of a lake—preferably on a clear winter evening—and at once commence operations by ascertaining, by means of two thermometers, the temperature of the water at the surface and at the bottom, and we find, let us say, that these are 48° and 45° respectively. A cold wind sweeps over the surface of the lake, so that the temperature of the water there is speedily reduced, let us say, to 44°. By this reduction in temperature, it contracts and becomes specifically heavier, when of course it sinks and displaces the comparatively light and warm water below, which rises to the surface, gets cooled below 44°, and immediately falls, displacing the warmer water at the bottom, which in turn rises, gets cooled and falls, its place being again supplied by lighter and warmer water. And so the cooling and sinking process goes on, the upper thermometer always indicating the highest temperature, when suddenly the magic point, 39°, is reached, when all movement at once ceases. The upper layer of water is still exposed to the cooling influence of the wind, and speedily falls in temperature, but it still retains its place. Our upper thermometer shows plainly that the water which surrounds it is being rapidly reduced in temperature, but the lower one remains stationary at 39°. At tbat temperature we know that water is heavier than at any other, and there like a stone it remains at the bottom, and as it is fully protected from outward influences by the mass of superincumbent water, its temperature remains very much at the same point. The water on the top, however, having nothing to protect it, gets colder and lighter every moment. Down the thermometer goes to 37°, 35°, 32°, and then a slight breeze ripples the surface, and the next moment a thin sheet of ice spreads itself over all. The ice, however, is colder and lighter than the water, so tbat it floats on the surface and acts as a blanket, protecting the comparatively warm and heavy water below from being cooled. During even the severest winter, therefore, only a thin superficial layer of ice is formed, which serves all the useful and ornamental purposes required of it, and when its duty is finished, it readily melts and disappears under the genial influence of the first few warm days of spring.

How a Fish Sees.

The medium in which fresh-water fishes live gives them a chance to see a great distance only in the borizontal direction, and the proper adjustment of the eye would make, under usual conditions, the optical axis take this direction. To me it seems impossible to explain the constant revolution the eyeball on any other hypothesis except that given, viz.: That the optical axis extends forward instead of sidewise.

When a fish wishes to eat anything, either at the bottom of the pond or at the surface of the water, it swims directly toward the object; and in this case the eyes are instantly adjusted in line with the body, so as to bring the image of the particle desired upon the posterior portion of the retina. In this case they lose their usual horizontal position.

If a fish wishes to turn to the right or left in the water, the first movement is that of the eyes in unison with the direction of the turning. This would be entirely unnecessary if the apparent axis was the axis of most distinct vision, as one of the eyes would see all that was to be seen in the side of the turning. After this movement of the eyes, the body turns enough to bring the eyes into their normal position; then there is again a movement of the eyes, and next a movement of the body. This causes a peculiar jerking motion of the eyeballs during the whole time of tbe turning of the body.—American Angler.

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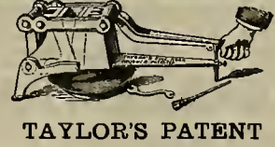
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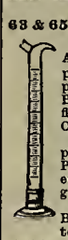
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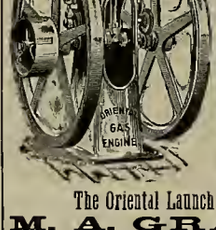
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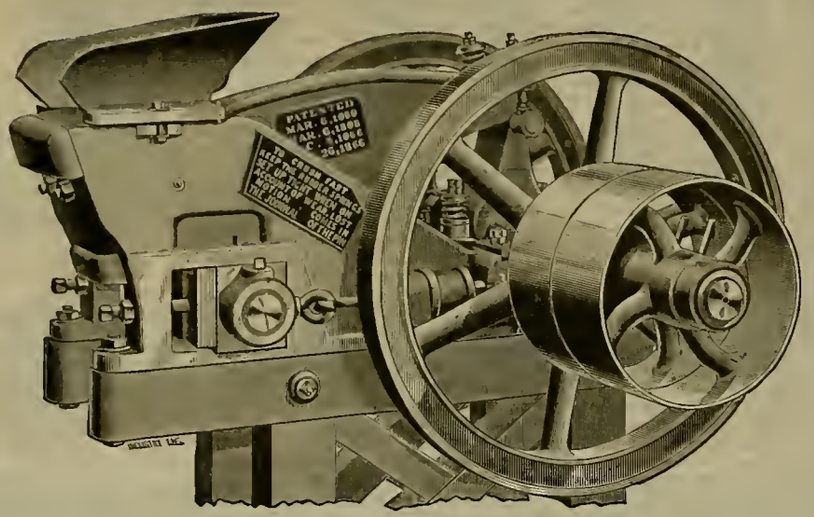

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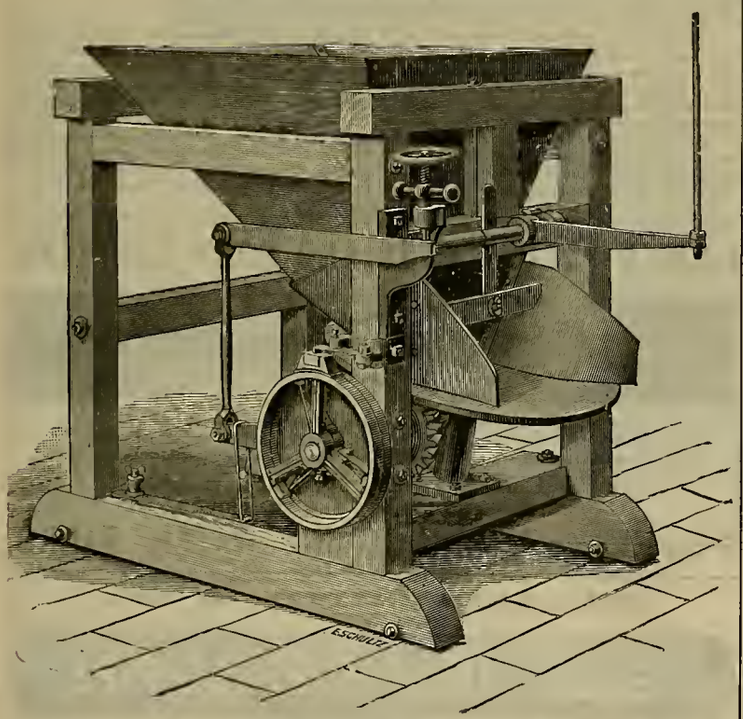

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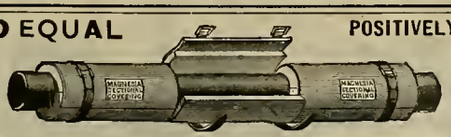

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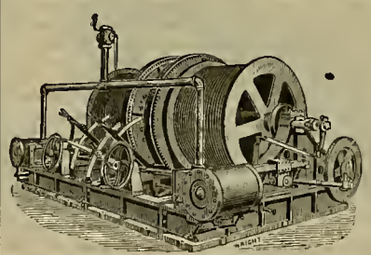

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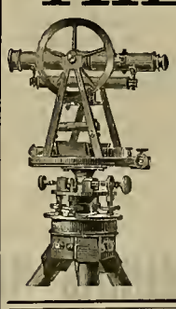

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Development of Electric Lamps.

Considerable interest is beiog felt as to the next most probable development of electric-light engineering. Except in detail, no great advance seems possible in dynamos, since at present many of them work at 95 per cent efficiency under full load. There is room certainly for improvements in transformers and accumulators, but these are hardly likely to be of such a character as to materially affect the economy of distribution as at present practiced. We therefore turn to the lamp, the other factor in the system, and ask whether improvements in lamps, of such importance as to render electric light generating-plant to be able to be worked at much higher rates of efficiency, are possible or probable. Here we find there is the possibility, but under present conditions hardly the probability. While the manufacture of these necessaries is in the hands of a great monopolist company, it is hardly likely that it will be very anxious to introduce changes which may interfere with the ordinary processes of manufacture.

The possibility is the commercial manufacture of higher voltage iocandescent lamps, says *Electricity* of London. It seems to be hardly fully realized by electrical engineers that if we can only double the electromotive force at the terminals of our lamps, we either are able to supply the same amount of electrical energy to the same district for a quarter of the expense of copper cooductors, or else for the same cost to supply four times the area. It therefore seems in every way desirable that we should endeavor to maoufacture higher voltage incandescent lamps. The usual E. M. F. employed at the present time is 100 or 110 volts. There are a few isolated installations where lamps of 150 and 160 volts are in use, but they are, comparatively speaking, few.

There are difficulties, we koow, in the manufacturing of say 200 or 220 volt lamps; the filament must be both very long and very thin—long enough to give us the requisite electrical resistance; thin so that the small amount of current required may render it incandescent.

We believe, however, that the real practical difficulty arises not so much in the manufacture of the filament itself as in the successful exhausting of the bulb. With such fine filaments, these will soon burn out, unless special care is taken in exhausting. In an imperfect vacuum there is also a constant electrical discharge from one side of the looped filament to the other with the high electromotive force employed to light the lamp. This may often be seen by shielding the glare from the filament, and carefully noting the blue discharge from platinum to platinum. This discharge continued over a lengthened period is very detrimental to the long life of the lamp, and to effectually prevent this requires more care in the processes of exhaustion than is possible without special attention being given to each lamp.

It is announced by the American press tbat Mr. Edison is at preseot at work on a 200-volt lamp. While giving Mr. Edison due credit for his great services to electrical engineering science, we would point out that the problem has been seriously attacked, and in some cases successfully surmounted, both in this country and in France. A recent number of *L'Industrie Electrique* contains diagrams of some French Edison-Swan 200-volt lamps, in which the extra loog filaments are supported by platinum loops welded into the sides of the lamp. We do not think, however, that this is the final solution of the problem. The joints in the glass bulb should be kept as few as possible in an ideal lamp, as each joint increases the chances of the glass cracking, and so causing leakage, due to the unequal expansion of tbe glass, and it is difficult to ensure such perfect welds of platinum to glass, that we are certain no air leakage takes place through it. Lamps of 180 volts were certainly succesfully made in this country three years ago, and there seems every reason to suppose tbat as soon as competition again exerts its beneficial influence on lamp manufacture, 200-volt lamps will be as perfectly made aod become as thoroughly reliable as our present 100-volt ones. This, we feel sure, is the direction in which the next great development toward the popularization of the electric light will be made.

THE POLYPHASE CURRENT IN FRANCE. According to the *Revue Internationale de l'Electricite*, MM. Guitton and Bertolus, owners of the Oerlikon patents for France, have concluded a 30 years' electric light and power contract with the municipality of Romans. They propose to use a 1000-foot fall, 17 miles distant from the town, and to employ polyphase currents. The Edison Company of Saint-Etienne also intends to adopt the polyphase system in carrying out the large transmission and distribution of power scheme voted by the municipality. Near Montpellier, a 200 h. p. fall is to drive polyphase dynamos supplying current to a group of villages.

AN ELECTRIC WAGON.—Trial was made in Chicago recently of a park wagon equipped with a small 3 h. p. motor and a 24-cell storage battery. With five persons in the wagon, it left the barn of the American Battery Company, on Monroe street, and traveled by the way of Winchester avenue to Jackson Boulevard, to La Salle street, to the compaoy's office at Monroe and La Salle Sts. The run was made in 22 minutes. After a few minutes, another party made the return trip. It is calculated that the wagon can make ten miles an hour easily with the present motor, and can climb any hill in Chicago.—Electrical Engineer.

Useful Information.

THE BOTTOM OF THE OCEAN.—There is a common but erroneous notion to the effect that a human body, or even a ship, will not sink to the bottom of the profounder abysses of the oceans, but will, on account of the density of the waters at a great depth, remain suspended at some distance above the surface of the earth. This is an error. No other fate awaits the drowned sailor or his ship than that which comes to the marine creatures who die on the bottom of the sea; in time their dust all passes into the great storehouse of the earth, even as those who receive burial on land. However deep the sea, it is but a few hours before the body of a man who finds his grave in the ocean is at rest upon the bottom; it there receives the same swift service from the agents which, in the order of nature, are appointed to care for the dead, as comes to those are reverently inhumed in blessed ground. All save the hardest parts of the skeleton are quickly taken again into the realm of the living, and even those more resisting portions of the body in time are, in large part, appropriated by the creatures of the sea floor, so that before the dust returns in the accumulating water to the firm, set earth, it may pass through an extended cycle of living forms. —Scribner's Monthly.

PERPETUAL MOTION.—A writer in the *Engineering Magazine* says: The true inventor has no regard for dogma; he believes he sees light ahead and moves toward it. It may be that what he sees is an *ignis fatuus* or a chimera, but he insists on discovering that for himself, and he is satisfied with no theories. I recently talked with a perpetual motion man and tried to dissuade him, being confident it would be easy to convince so intelligent a person that his scheme was not possible. But he arose above my dogmas in an instant by showiog that the whole solar system is a perpetual-motion device, moving without assignable cause and not varying an instant of comparative time within the period of its recorded history. I thought of Galileo and stopped.

BICYCLES OF ALUMINUM.—Several inventors of reputation are now engaged in the manufacture of bicycles principally made of aluminum with an alloy of titanium, whereby the strength of aluminum is increased over 75 per cent without increasing the weight of aluminum or its specific gravity. The alloyed aluminum is said to stand a tensile test of 73,500 pounds per square inch compared to pure aluminum to 22,300 pounds, cast iron 17,000 pounds, cast brass 23,000, good wrought iron 48,000, cast steel 61,000, Schmeidharenguss 200,766 pounds tensile strength per square inch.

A SCOTCH boat-builder is constructing a yacht entirely of alumioum alloy. The metal is as white as silver and posesses a breaking strain of 24 tons to the square inch. It is unaffected by water. The yacht, which instead of being painted will be polished, will be about 32 feet long and eight feet broad, and will be provided with a roomy cabin paneled in oak and a commodious forecastle; and the deck fittings, as well as a center-board dingey which will accompany the yacht, will be made of the same white metal. If this experiment should turn out successful, a new departure in yacht construction and fittings may be expected.

OVERCOMING GRAVITY. — A boy who could not stand still for a single moment on a sheet of thin ice without breaking through it, could skate over it in perfect safety, simply because he put himself in antagonism to gravitation by pursuing a line of motion at a right angle with its downward vertical pull, and consequently lessening his weight as tested by a spring balance. In fact, the increase of velocity of any body not approaching the center of gravity, whatever its momentum, tends to lessen its weight, and were the whole periphery of the earth a series of the most delicate and sensitive spring balances, a body rolliog over them throughout the whnle of the vast circuit would register its weight more or less according to its velocity.—N. Y. Herald.

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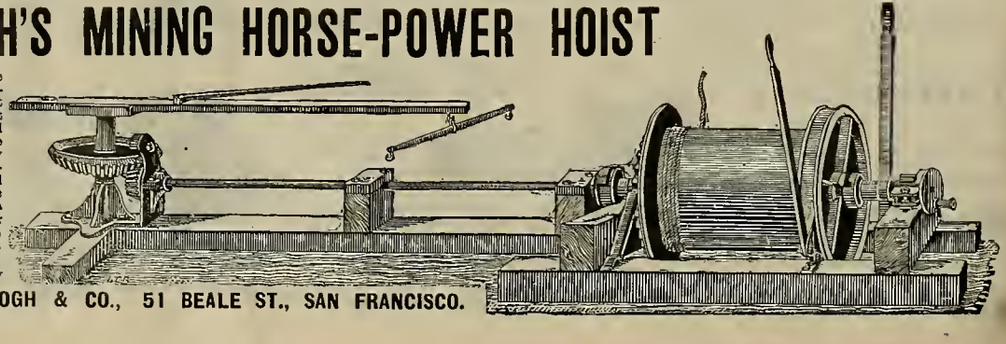

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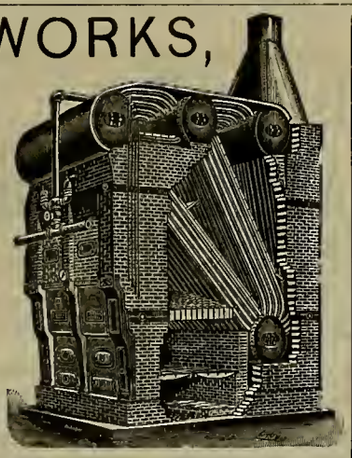

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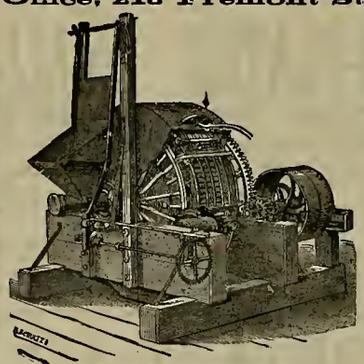

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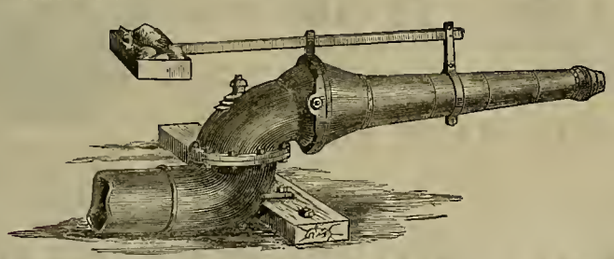

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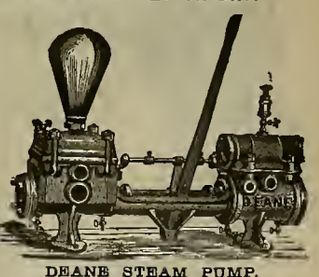

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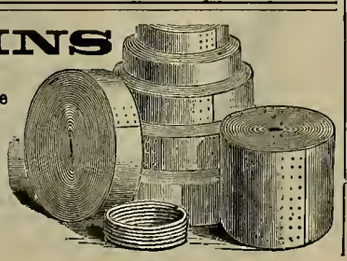

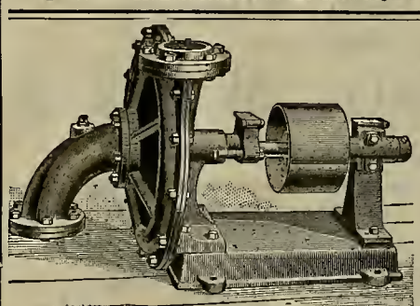

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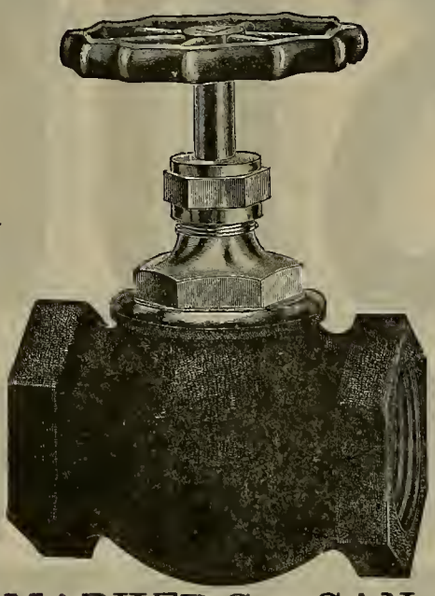

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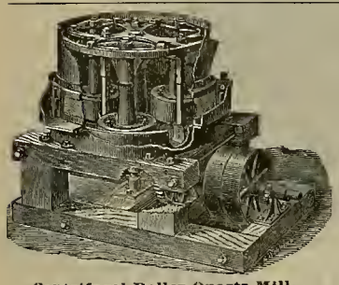

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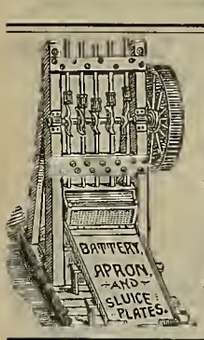

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

Water.—Amador *Ledger*, Aug. 27: In the Bay State the flow of water has become so strong that they have been compelled to adopt the double-bucket system. New rope for this purpose has been sent for, the water in the meantime gaining upon them. The pressure, however, is no doubt merely temporary. The mine continues to look well. We understand 75 cents per share has been offered for the stock. At Bright's claim the prospecting operations have been suspended for a few days. They are down 120 feet. It is the intention to sink to 150 feet, and drift for the ledge at that depth. The hoisting of dirt by windlass at the present depth is found to be too slow and laborious, and steps are being taken to put in a horse whim.

Wheeler.—Claib Wilds & Co. are getting out some rich ore from the Wheeler mine, west of Plymouth. They commence hauling to the Cosmopolitan mill next week. They intend having 200 tons crushed as a test before putting in machinery. There is a company negotiating with Mr. Vaughen for a bond of the Caucasian mine, west of the Bay State.

Quartz Mountain.—The developments being made at the Gold Mountain mine are still encouraging. They have a fine ledge, widening out as they go down. The extent of it is merely a matter of conjecture. They are doing some substantial work in securing the ground. Ford thinks it costs less to put in an extra timber than it would to take out a few crippled miners. The Goodman mine is still in an unsettled state, but the late find on the mount may have a tendency to wake them up.

Oleta.—The mine has started up once more. There are six men at work now, and more are to be put on in a short time, which will liven up our little village.

Butte.

A Bonanza.—Oroville *Mercury*, Aug. 27: Gardner Osgood of Bangor informed the *Mercury* yesterday that the Catskill mine at that place has struck a bed of gravel in the blue lead that is 17 feet deep and 170 feet wide. It averages $5 to the ton. The length of the channel, of course, is unknown. That the blue lead is a permanent institution, and will prove a bonanza, is an established fact.

Bangoa Booms.—Oroville *Mercury*, Aug. 25: Hay & Clark of Bangor blue lead fame made a cleanup this week, and it was so satisfactory that they are putting in five more stamps, and by the end of the week will have 20 in operation. They are also preparing to erect a building 100 by 60 feet over the mine, and also to build bunk and boarding-houses for the miners. The Catskill, Bishop and other mines are also doing splendidly.

Outlook.—*Register*, Aug. 25: The mining outlook in Butte is bright at present. The Pelo Alto Co. is running a cut so as to use only its lower tunnel for getting ore into the mill. The big shaft on the Banner is down 355 feet, and is still being sunk. The Shakespeare mine is being fully developed. The Stow mine is proving one of the richest and best mines in the State. The rock about Yankee Hill is turning out better than was expected, while the mines in the Gravel range section are yielding well. At Bangor the blue lead is attracting more attention than ever, while about Wyandotte it is being sunk upon. There is no mining district but what is doing well, and there is a large amount of prospecting in various portions of the county. From Fall river, at Cascade, on French creek, up on Magalia ridge and in other localities the reports are encouraging.

Calaveras.

Lone Star Mine.—Calaveras *Chronicle*, Aug. 27: We regret to state that the workings of the Lone Star mine at West Point are to be retarded for the time being on account of the failure of water for propelling their air-compressor and 20-stamp mill. Four power drills have been kept pounding away day and night for the past six months driving a tunnel south on the lead from the Mokelumne river level, which will, when driven back to the center of the lead, give nearly 700 feet of backs. Then by a system of upraises connecting the upper tunnels and lateral crosscut to the perallel lead, the Reed & Hillery, will open up the mine in a thorough manner. One chute of ore has been encountered in the lower tunnel, demonstrating the fact that the pay ore "goes down," which fact is most encouraging and insures the mine to be of long life. M. A. Hurley Esq., president of the company, has exercised both courage and good judgment. Being backed by a company that relies on his judgment, we are forced to believe that the Lone Star will duly reward that outlay.

El Dorado.

Mill.—*Mt. Democrat*, Aug. 27: We expect to soon chronicle the event of the clatter of stamps at the Gregory Bros.' mine, Smith's Flat. They have about completed the erection of their mill and will commence crushing at once. They are considerably south of their old works at Dirty Flat, but on the same channel. The boys have cheerful smiles and plenty of good gravel, all of which denotes success, an article we wish them plenty of.

Gravel.—The Stewart Gravel mine, at Webber creek, which is now owned and operated by John Melton, is proving a productive property. This mine has paid more than one fortune in the past, and all indications point to a fortune to come. We sincerely hope that the present management will succeed, for with success they will employ many men and prove a great source of profit to the entire community. The mine and 10-stamp mill are in the hands of competent miners, as the following list will attest: Superintendent, George Cozens; foreman, Charles Henson; millman, Wm. Stafford; miners, John Kern, John Baker, Frank Voss, Frank Pincini, Jos Tunse, Andy O'Neil, Tom Williams, Jim Donovan, Net Jones, John Donogan; carmen, Henry Sprick, H. McCoy, Bob O'Neil and Oscar Bunker.

Taylor.—Georgetown *Gazette*, Aug. 23: The Taylor mine is coming to the front as one of the best equipped milling plants in the State. Quite a village is springing up around it. The mill building and hoisting works, machinery, electric light apparatus, etc., are of the most approved styles and of the most skilled workmanship. The timber yard is large and neat. Two daily stage lines connect the mine with Auburn and Placerville, and a telegraph office gives it still greater advantages of communication. Its water-power advantages are all that could be desired, coming from the California Water Co.'s main canal, at a point just below Georgetown. The entire business is systematically and intelligently managed under the Chapman Bros.

Nevada.

Live Oak Mine.—Grass Valley *Telegraph*, Aug. 27: The owners of the Live Oak mine are taking out some very fine pay rock at the present time. For the past two years the mine has been successfully worked by means of an errastre. The owners recently bonded the property to a well-known mining man, who is about to organize a company and build a 10-stamp mill at the mine. A crushing at the Rogers mill was cleaned up yesterday and the quartz yielded $35 per ton. With a good mill on the mine this property would pay dividends right from the start.

Contract Let.—Grass Valley *Telegraph*, Aug. 20: The Omaha Mining Co. has let a contract to A. G. Chew to run a ditch commencing at a point near Larimer's mill on Wolf creek and to extend to the mine. The distance will be about one-half mile and the water will be used for hoisting and pumping power at the Omaha. It will take about 30 days to complete the work.

Quartz Mines. — Cor. Secramento *Record-Union*, Aug. 30: Your correspondent arrived in Nevada City on Saturday, and spent several days between this little city and Grass Valley. I found the business outlook excellent, and everyone looking for the best season that has been experienced in this section for many years. The bright prospects were in consequence of the renewed activity in quartz-mining interests. Through the kindness of Judge J. M. Walling, I was enabled to get definite information regarding a number of the principal mines in and around Grass Valley and Nevada City, notably the Mountaineer mine, which has been sunk to a depth of 500 feet. This shows an abundance of rock paying $25 per ton, has a 10 stamp mill, and is paying dividends. The Champion mine is down about 1000 feet, employe 60 men, shows plenty of rock paying from $25 to $40 per ton, and is paying good dividends. It has a 15-stamp mill, and is putting in 10 stamps more to increase its power. The Nevada City Quartz mine is down to the depth of 1000 feet, employs 500 men, has a great quantity of rock, a 20-stamp mill, and is paying handsomely. The Providence mine is down 1400 feet in depth. It is an old mine, and is yielding some very rich and a large amount of low-grade rock. It has a 40-stamp mill. This mine in the past has yielded large fortunes to its owners, and from present indications bids fair to outdo its past record, having everything in the way of machinery that modern ingenuity can invent. It employs a large force of men. The Wyoming mine, an old one, is being reopened at a depth of 800 feet, and promises splendidly. The Federal Loan mine has struck a depth of 600 feet, and is just fairly opened upon paying rock, which is of such a quality as to make glad the hearts of its owners. It has a 10-stamp mill, and employe a good force of men. Besides the above there are the Pittsburg mine, with a 20-stamp mill; the Gold Flat, Gold Tunnel, California, Manchie, Charmot, Banner, Spanish, Constitution and Texes, with their mills end hoisting works, being run and prospected to a greater or less extent, giving employment to a larger number of men than were ever before employed in mining interests in this section. All the above, besides many more, are being worked and run by water-power. Taken all together, the outlook for our two mountain towns is excellent.

Siskiyou.

A Rich Ledge.—Yreka *Journal*, Aug. 24: Walters, Mullan & Spencer, of Portland, Or., are working a rich ledge on Siskiyou mountain, near Hilt's sawmill north of Henley, which ranges from 16 inches to five and six feet in width. Some seven or eight men are employed in getting out quartz, and realize from $100 to $200 a day. The mill used is of a new style, with two stamps, worked on the principle of a steam pump, the stamps being on the end of the cylinder shafts, an invention of Mr. Spencer, one of the owners of the mine. The Gold Ball Mining Co., working the old Klamath and other ledges at the Salmon river, is to be reorganized on a more extensive scale, to introduce machinery of the latest inventions for saving gold, in which the present principal owner, Mr. A. Bell, will continue his interest. The quartz prospects well and the ledge is extensive, which can be made to pay handsomely with superior machinery. The sulphurets are also very rich, from which the gold can be secured by proper machinery, instead of going to waste as at present in this and other quartz mines throughout the county. We learn that the miners on Indian creek, above Happy Camp, near Klamath river, are taking out considerable gold this season, and the yield will be equal to if not greater than the usual average.

The Districts.—Yreka *Journal*, Aug. 24: R. G. Dunn, of the State Mining Bureau, sent here by the State Mining Engineer Wm. Irelan, Jr., to investigate the mineral resources of this county, and report thereon, returned from an extended journey of about two weeks in the Scott valley, South Fork of Scott river, Salmon river, Scott river, Klamath river, and all the intervening and adjacent mining districts, highly pleased with the outlook and the certainty of Siskiyou coming to the front as one of the best mining localities on the entire Pacific coast. At Quartz valley, he found that the R. H. Campbell & Co. mining ground, since coming under the menegement of English capitalists, is to be worked in the right manner, by a systematic opening of the entire claim without working in spots. At present, the water supply being light and getting shorter until winter again, preparations are in progress for drifting on an extensive scale, so as to secure the rich pay gravel from bed rock for washing in the flumes when the winter and spring rains fill the ditches for such purpose and for operating the giants. At Oro Fino and vicinity, Pinery, South Fork, McAdams creek, Patterson creek and many other mining localities bordering on Scott valley, he found good mines, and all the miners feeling hopeful of rich rewards in store, and especially in quartz mining, which is becoming very extensive in most of the places above named, including Quartz valley. Going over to Salmon river, Mr. Dunn was highly pleased to see such an excellent road being built over Salmon mountain, and thinks it will be one of the finest roads in the county on completion, as it has a good easy grade and is solid by its construction over rock formation nearly the entire distance. This road will be a great benefit to the mining and farming industries of Siskiyou, by reason of easy hauling of machinery to the mines, besides furnishing the farmers with a market for their produce. In the Salmon country, new discoveries are constently being made in both quartz and placer claims, and still the country is scarcely half prospected compered with other localities in the State. Hydraulic mining is carried on extensively at many places along Salmon river and its tributaries, among which he noticed the well-rigged claims of Spooner & Co., Bennett & Co., and others. He also found rich paying quartz mines on White's gulch, at Black Bear, the Gold Ball claim, and a number of new locations. Along the Klamath are a number of very good hydraulic claims, from Oak Bar and Scott river down to Happy Camp, and also on Scott river, with considerable mining in the river beds. In fact, Mr. Dunn says he saw nothing played out in Siskiyou mining, and that everything seemed to be on its feet, with new mining plants being put up everywhere he visited.

Tuolumne.

More Stamps.—*Independent*, Aug. 20: It is rumored that the managers of the Belleview mine have decided to put in 20 stamps more, and run the mill by waterpower. It is now run by steam, and wood for the mill and hoisting works costs probably $25 a day.

NEVADA.

Washoe District.

Cons. Cal. & Virginia.—*Chronicle*, Aug. 27: There has been extracted from all parts of the mine during the week 938 80-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $26.61 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $21.88 per ton per battery samples. Bullion now on hand in our assay office, assay value, about $14,900.

Ophir.—1465 level: From the south drift, 101 feet below the sill floor of the 1465 level, at a point 42 feet in from its mouth, the west crosscut No. 2 has been advanced 19 feet; total length, 35 feet; in porphyry with little quartz.

Mexican.—On the 1465 level of the west crosscut, which was started from the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, has been advanced 21 feet; total length, 33 feet, continuing in porphyry and clay.

Union Con.—900 level: The joint Union Con. and Sierra Nevada west drift has been extended during the week 26 feet; total length west from the joint shaft, 2349 feet. The face is in porphyry and small stringers of quartz.

Utah.—340 level: From the end of the north drift (at a point 424 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 23 feet; total length, 220 feet, continuing in porphyry, clay and quartz.

Sierra Nevada.—The west crosscut No. 2, Kenosha tunnel, started from north drift, 860 feet in, has been advanced 30 feet; face in hard porphyry and stringers of quartz. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 26 feet; total distance west of shaft, 2349 feet; face in soft porphyry and small stringers of quartz.

Annex.—On 420 level: East crosscut No. 1 advanced 14 feet; total length, 88 feet; formation quartz. Repaired the east timbers in main north drift between crosscuts four and five.

Gould & Curry.—During the week we have extracted from the old stopes on the 200 and 400 levels 28 tons of ore, giving a car sample of $18.20 per ton. Sent to the Occidental mill 110 tons; crushed 105 tons; battery assay, $18.06. On the Sutro tunnel level, the joint north drift with the Savage Company has been advanced 10 feet and discontinued; total length, 530 feet.

Best & Belcher.—900 level: During the past week the north drift from east crosscut No. 1, 100 feet from switch, has been extended 14 feet through porphyry, clay and quartz; total length, 102 feet.

Hale & Norcross.—We continue retimbering main shaft above the 1100 level. Main Incline—Are making the necessary repairs. 1800 level—During the week advanced and timbered the north drift 25 feet; total length, 140 feet. The south drift on this level was advanced 25 feet, making its entire length 120 feet. The formation in these drifts is porphyry.

Challenge.—All work has been suspended in the mine since the 21st inst. to permit of repairs to the main water tank and other necessary repairs on the surface.

Potosi.—The northwest drift from the 1800 station, Ward shaft, has a total length of 795 feet; face in hard porphyry. Extracted and sent to the mill during the past week 216 1100-2000 tons of ore from the 930, 1150 and 1300 levels. Milled during the week 170 tons. On hand at mill, 112 1300-2000 tons; average battery assay, $27.26; average car sample assays, $30.20. Shipped to the Carson Mint 335½ pounds of crude bullion. All work in the mine has been suspended since the 21st inst. to permit of repairs to the main water tank and other necessary repairs on the surface.

Ward Combination Shaft.—The joint Alpha and Exchequer south drift from the north line of Exchequer, 1800 level of Ward shaft, has a total length of 423 feet; face in porphyry. The joint Bullion and Potosi northwest drift from the 1800 station has a total length of 765 feet; face in hard porphyry.

Bullion.—The raise from the east crosscut, 320 feet south of north line, 1300 level, is up 25 feet; top in low-grade quartz. The northwest drift from the 1800 station of Ward shaft has a total length of 665 feet; face in hard porphyry. No work has been done in the mine since the 21st inst., owing to the temporary closing down of the Challenge shaft.

Occidental.—From the stopes on 350, 400 and 450 levels have extracted and milled 170 tons of ore of the average assay value of $19.40 per ton as per battery samples. West crosscut No. 4, from north drift, 750 level, has reached the footwall and been stopped. Have resumed driving the main north drift on this level; face in low-grade quartz. The Zadig drift, Sutro tunnel level, has been advanced 21 feet; face in porphyry.

Alpha.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 423 feet; face in porphyry.

Exchequer.—The joint Exchequer and Alpha south drift from north line of the Exchequer, 1800 level of Ward shaft, has a total length of 423 feet; face in porphyry.

Con. New York.—The engine is at the head of the winze, 640 level, and work resumed in the winze.

Tuscarora District.

Navajo.—*Times-Review*, Aug. 26: In the stopes above the 350-foot level, the ore continues about the same.

Del Monte.—Have crushed 423 tons of ore, assay $31 per ton. On hand 29 tons of concentrates, assay value (estimated) $236 per ton.

North Commonwealth.—Have crushed to date at the concentrator 423 tons, assay $31 per ton; on hand 41 tons of concentrates; hoisted two cars first-class ore.

North Belle Isle.—An upraise has been started from the south 500 stopes to connect with the 400-foot level.

Belle Isle.—West line crosscut, 250-foot level, extended eight feet through the vein and a drift started south on the rich ore, progress three feet. The upraise from the gangway drift, same level, extended four feet on the ore, which is improving in size and quality; rock very hard.

Navada Queen.—No particular change in the stopes; extracted 32 cars first-class ore, assay value, $260 per ton, and 134 tons second-class; battery sample $24 per ton.

Commonwealth.—Have started stoping from west line drift, seem of high-grade ore exposed, balance second-class. Joint east line drift has been stopped and a drift started east from chute 3, progress 15 feet, showing a little ore in the face of the drift. Hoisted during the week three cars first-class ore, car sample assay $400 per ton, and 139½ tons, assay from battery $23 per ton.

ARIZONA.

White Hills. — Monave *Miner*, Aug. 29: Every mine in the White Hills country is showing more ore than at any time since the mines were discovered. Development but adds to the vast mineral wealth of that section. The Horn Silver is showing much richer ore in the tunnel and shaft than on the surface. The tunnel is in about 30 feet and the shaft has reached a depth of fully 40 feet. William Bohne and William Davis have a carload of ore at the sampler from the Green Linnet mine in Union basin, where they are having it sampled. The ore carries a high percentage of gold. The Home Pastime mine at Mineral Park has six men at work and is turning out large quantities of the richest kind of silver ore. The ore in the bottom of the shaft will average fully 1,000 ounces silver per ton. Beebe's big team hauled out the well-boring machinery for Page & Co., of Los Angeles, who contemplate sinking a well in Gold basin, for the purpose of obtaining a flow of water sufficient to run a ten-stamp mill on the Senator and President mines. Supt. Grant of the Gold Bug mine has just disposed of 150 tons of ore to the Needles Reduction Works. The ore is the second class now on the mine dumps and will be hauled to the river and shipped to the Needles by steamer. M. McLeish has let a contract to sink a four-inch hole in the bottom of his well at White

Hills. The well is now down 55 feet and a four-inch drill will he run from the hottom until water is reached. Mr. McLeish has gone out to White Hills to superintend operations. John P. Burnitt, one of the owners of the White Hills mines, came in from San Francisco this morning. He informs us that the deal with San Francisco capitalists is off, the parties not having come to time. It is thought the properties will hc sold to other parties within a faw weeks. Tbe naw shaft on the G. A. R. mina is down 40 feet, and in tha hottom is exposed tha largest and richest body of ore ever seen in the property, the entire shaft being in ore. The ledgs is the higgest of all the veins in the White Hills, stringers from the main lode covering the whola hillside. P. R. Washington is in from Minnesota district, and from him we learn thet in the Horn Silver mins a strike of the richest ore ever fonnd in that country has been made' Under a limestona cap a ledge of ore four feat in width was fonnd, showing horn silvar and chloride to the value of 800 onnces per ton. The boys are jubilant over their new discovery.

GOLN ORE.—Tombstone *Epitaph*, Aug. 28: Gold ore, as a rule, in southern Arizona carries too mnch sulphurets to mill successfully without tha use of pans and settlers. In the Buckhorn basin, about eight miles south of Fort Bowie, howevar, there exist ledges of gold ore that contain absolntely nothing bsse, and all of the gold can be saved on plates without any difficulty. Owan Williams, who was there in '80, discovered a gold ledge, on which he did soma work. He left it, however, and after sevaral years retnrned and went to work upon it. At a depth of 50 feet he has thres feet of ore that will mill $20 per ton. The ledge is between porphyry and slate. Mr. Williams has intarested Tombstone patties in his mine. Good reports come from Golden Rule district. Bauer and Pearca are down 50 feet on their claim and have a drift in 20 feet. They have three feet of ors between two smooth walls that will retnrn $60 per ton in gold, silver and lead. A second ledge of lively-looking gold quartz, carrying ahout $20 gold per ton, comes into the main ledge abont 40 feet from the shaft, and it is for this point of intersection that the drift is being rnn. Gold ore is heing taken ont, and a carload is already on the dump. In the vicinity of the State of Maine, in Tombstone district, there are in the neighborbood of 30 men chloriding, and all doing well. A carload of ora shipped from the Guiding Star, belonging to Col. Herring, returned $5000. Threa men took this out in a short time. The T. M. & M. Co. is shipping the nsual amount of ore. Sinking below tha water level has been resumed, and tha shaft is now down 115 feet below the water level. Tha water does not bother mnch, and with the pump which is on the way, it will be a secondary consideration. Mr. Staunton says sinking will ba pushed without any let-up until somathing hesides ordinary obstacles drives them out. The crosscut which was run from the 100 lavel below water did not encounter pay ore. Mr. Staunton also states that any lalk ahont shutting down, owing to the low price of silvar, is ridiculous. They have a good balance in the treasury to go on, and if silver gets so low that mining will not pay, and the treasnry is empty, the company may consider the question of going slow, but not until then.

BRITISH COLUMBIA.

SILVER.—Nelson *Miner*, Aug. 26: It is claimed that $2000 worth of ore a day is being taken from the Neosho. One hncketful was seot up the shaft full of wire silvar and valued at $700. Placer-digging at Hall creek is causing quite a little local excitement. Franch Joe and his partner took out over $40 in one day and hetwean 20 and 30 men are at work making from $5 to $10 each a day. Rumors are afloat of a very rich strike on Toad monntain. The Great Northarn qnotas a throngh rate to Great Falls from Kaslo of $8 a ton for ore. Tha shipment of ore from the Skylina, which was sent out with a view to determining the best mathod of treating the ora was delayed for six weeks at Bonner's Ferry. This will cause so long a delay in gatting tha reports on it that it is qnestionable if a mlll can now be pnt up this autumn befora the snow flies. Retnrns from the Helena sampling works show that tba. 600 pounds of ora shipped thera by James F. Wardner from the Freddie Lee mine went 255 ounces in silver and 78 per cent lead. Exploration this fall seems to he workiog easterly and northerly. Prospectors are pushing their way in the direction of the houndary line between East and West Kootenay from Fry creek and from the creeks that fall into Crawford's bay. The country is practically nnknown as yet, hut from present indications it will not be long before rich discovaries ara made in this direction.

LOWER CALIFORNIA.

CEDROS ISLANN ORE.—National City *Record*, Ang. 27: The steamer Farralon, chartered by the Cedros Island Mining Company, brought up one of the largast and richest cargoes of gold ore avar handled hy the company. It consists of 10,300 sacks, or 515 tons. There are still 3000 sacks of choice ore on tha dump, and by the time she returns a large cargo will be ready for shipment. The cargo is being hauled out to-day hy special fraight on the N. C. & O. The works will ha started at once, and with a crushing capacity of 20 tons a day this cargo will keep them running day and night for a month, and it is understood that before that time expires another large cargo will be here.

THE TEPUSTETE IRON MINE.—*Lower Californian*, Ang. 26: Mr. A. Evans, Jr., representing the Oregon Iron and Steel Company of Oswego, Oregon, returned the first of tha week from an inspection of the Tepustete iron mina at San Isidro, 50 miles south of Ensenada. His company operates tha only blast furnace and iron pipe fonndry on the coast, and the plant comprises the finest charcoal blast furnace in the world, as well as the best charcoal-manufacturing plant, which has a capacity of 10,000 bushels a day. The production of the pipe-manufactnring plant is ahout to be increased. The company is one of the strongest iron-manufacturing firms on the continent and has an operating capital of $6,000,000. While there is an abundance of low-grade ore in tha vicinity of the plant, the company is looking for high-grade ore to improve tha quality of its ontput and increasa tha prodnction, and this class of ore, Mr. Evans states, is found on the western coast of Lower California. He was highly pleased with the Tepnstete mina.

THE rumor is current that Capt. Rodda, of tho Princess Company, has made arrangements to operate La Fortuna gold mine at Tanama.

NEW MEXICO.

PYRAMID.—*Southwest Sentinel*, Aug. 23: A full force of men will bs put to work at Pyramid in a few days. Tha Mimhres Consolidated Co. shipped 661 pounds of silver bullion from this plsce to New York last week. Several men are at work at Fleming, and the outlook for that camp is hetter now than it has heen for some time. The new sampler at Deming is receiving considerable ore, and it is thought that a large smelter will be erected there soon. The output of tha mines at Hillsborough last week reached 415 tons. The production of the district is increasing rapidly, and tha smelter and mills there are taxed to their utmost capacity. Work on the Colchis mill has not progressed as rspidly as was expected this snmmer, but Dr. Jenkins says that he expects that it will be complsted before winter. When completed, this will ha a very important adnition to the mills here. The Bremen mill has been in operation a week, hut no cleanup has been made yet. It is expected that the first brick will ba tnrned out about the first of tha month. The mill is running on ore from the Sherman mine, and there is enough on hand for a long run. The Gold Hill mill wss closed down last week, but will commence this week on a rnn of ore from Patterson'a mine. A good strike has been made in McDermott's mine, west of Carlisle. The mine has been producing steadily for some time, and the ore has been treated in the Carlisle mill. Manager Waring of the Flagler Works is uncertain as to when the works will be started. The low price of silver is not very encouraging to miners, and it is doubtful whether ora enongh can ba obtained to keep the works running. They will not be started until a sufficient supply to keep them running is assured.

OREGON.

FROM MYRTLE CREEK.—Eugene Register: The main ditch at the Myrtla Creek mines has been extended a mila and a quarter to tap mora small streams. Washing is not now in progress, but everything is being put in readiness to begin operations as soon as the fall rains hegin. Scarcity of water has always been a drawback to mining operations in sonthern Oregon, but the Myrtle Creek Co. is doing a large amount of ditching to provida water to run the giants the year around if possible. Mr. Holden has completed the excavating on his ditch contract, and is now constructing tha flume and rockwork, which he expects to completa the first week in September. This will complete hia contract, on which he has been at work the past three months or more.

UTAH.

ONTARIO AND DALY.—If indications and a general rumor count for anything, the Ontario aod Daly mines are to have an assistant secretary in the person of a Mr. Skerm. Tha gentleman arrived in the Park a few days ago, and has taken up his quarters at the Ontario mill boarding-honse. He has full authority to visit any and all parts of both mines, and has been indnstriously engaged for some daya making a thorough examination of hoth properties. Tha *Record* has been told, and the rnmor is general, that Mr. Skerm will assume tha dnties of assistant suparintendent on the 1st of September, and tha truth of the matter will come to light on that date. About four years ago the Ontario Co. shipped to Park City from Bozeman, Montana, a large lot of mining machinery, consisting of hoisting engines, pnmps, drums, wire cable, etc. This machlnery has been stored at the lower depot ever since, with the exception of one of the hoisting engines, which was taken to the Ontario machina shops last fall and thoroughly overhauled and placed in perfect working order. This week the engine complete, together with drnms and wire cable, was shipped to Coalville, whera it will ba used by the Home Coal Co. in its mines.

ORE AND BULLION.—The Crescent shipped tbis week 510,000 pounds of concentrates. The Marsac mill shipped on tha 20th 13 hars of hullion, containing 13,672 fine ounces of silver. The Ontario mill shipped 30 bars of bullion this week, containing 18,445.44 fine onoces of silver. The following lota of ora were received at and forwarded from the Mackintosh sampler during the past week: Ontario, 438,800 pounds; Daly, 53,130; May Flower, 589,440; Silver King, 138,970; Anchor concentrates, 227,272, May Flower concentrates, 65,870; Silver King concentrates, 94 920, and Cumberland, 2980 pounds, a total of 1,611,282 pounds.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Snbscription rate, $3 a year. Extra copies mailed for 10 cants, if ordered soon enough. If already a subscriber please sbow tba paper to others.

Market Reports.

Local Markets.

SAN FRANCISCO, Sept. 1, 1892.

Trade the past week was fairly active, with a marked increase in the volume of goods sent out on orders' Upcoast ports have taken quite freely, as have the more distant mining camps and also the agricultural sections. One of the most encouraging signs of the times is the increasing attention which is being given to direct trade by sail with Atlantic and foreign ports. G. W. McNear has laid the Dechmoot on for London, while Balfour, Guthrie & Co., have the Miefield, and H. Hughes & Co., the Glamis, loading for the same port. Balfour, Guthrie & Co., have about finisbed loading the California for Liverpool, and have placed the Dechmont on to follow her, while G. W. McNear bas the Holt Hill up for the same port. John Rosenfeld's sons have the M. P. Grace up for New York, and the Florence and Commodore Allen to follow. Schact, Lemcke & Steiner have the J. C. Pfluger on the herth for Bremerhaven, and J. J. Moore & Co., the Lady Lampson for Sydney, while in the Island trade are the Discovery and Planter in the Hawaiian Line, and the S. N. Castle io the Spreckels Co's Line. All these vessels are taking general cargo.

In the local money market the rates of interest are a shade firmer. There is an increased call for funds with which to make advances on wheat going into warehouses, hut this is partly offset by remittances from the fruit-growing sections and mining districts. The sales of wheat so far this season do not aggregate within 30 per cent of what they did during the like time in 1891. The dividends disbursed in August were a little over $1,100,000 against about $1,200,000 in the like months last year. The disbnrsements for improvements in railroad construction, etc., continue heavy. Eastern financial markets report money hotb on time and call, in full supply, hut rates have a firmer tendency. Exports of specie for the week ending with August 20th were $2,252,000, and since January about $67,500,000, against $85,400,000 during the same time in 1891. Imports of merchandise at New York for the week ending with August 20th were $11,765,000, which is $1,630,000 below those of the previous week. The ease in the money market is reported to he the result of the appearance o cotton hills, which are now heing pressed on the market, In the central States all s'gns point to more active money in September and Octoher.

The cholera scare abroad is doing very much to complicate financial affairs in Europe for the time heing. Late advices report the money centers greatly exercised over the appearance of cholera, and until the virulence of the disease abates there is little hope of affairs resuming their normal con ditions. It is claimed the cholera scare will probably postpone the meeting of the International Monetary Conference, but this report is said to be founded on hints thrown out to feel the public pulse on the question. The London *Economist* in an editorial on the monetary conference, says: "So far as the rehabilitation of silver is concerned, that is foredoomed to failure. But very considerable expectations are heing built upon it in the United States, and when these expectations are falsified, as tbey will be, the apprehensions that are now being excited in the States by the overflow of gold from the country will become intensified. . . . Exactly how matters will move it is, of course, impossible to predicate, hut this much at any rate is clear —that the failure of the conference will discredit silver more than ever, and cause gold to he more sought after, aod that is the cardinal fact which those wbo have to consider the prohable future of the great money markets should keep in view. In the end we believe silver will rather benefit than suffer from the cessation of compulsory purchases by the United States Treasury." Secretary Foster betrays not the slightest apprehension of future trouble, nor will anything be done by him to prevent shipments of gold.

SILVER.—The market has fluctuated at around 83 cts. in New York and 38 d. in London. It is now quite generally conceded that the output of the mines does not meet its world's requirements, and as a result the surplus which has been accumulating, is being absorbed. While this is now a generally admitted fact, yet those in position to know affirm that a moneyed syndicate is manipulating the market value of silver, so as to make successful moves in all securities and commodities controlled hy the price of that metal. If this is the true secret of the present unwarrantable depression in silver, then it is only reasonable to conclude that when the object is secured through the present depression, much higher prices will be in order.

MEXICAN DOLLARS.—The market held fairly steady, hut dull at around 67⅜ cts.

QUICKSILVER.—Receipts the past week aggregate 540 flasks and the exports by sea 75 flasks to Mexico.

BORAX.—Exoorts by sea the past week aggregate 1010 centals. The market is easy at unchanged quotations.

LIME—Receipts the past week were 2858 bbls. There is a fair shipping demand from the Hawaiian Islands. Our market is quiet at from $1.25 to $1.50 per bbl.

ANTIMONY—The market is weak at lower quotations New York mail advices quote as follows: 10⅝@10¾c tor Hallett's, 11¼@11½c for L. X, and 12½@15½c for Cookson's.

LEAD—The market is strong, but the strength of the market is in sympathy with the East, wbere slightly higher prices obtain owing to stronger holding.

PIG IRON—The market does not show any material change. The consumption with us is said to be quite heavy. Eastern mail advices report that at Philadelphia there are indications of an improvement, but Chicago and Cincinnati continue to reflect the heavy pressure upon the market of large accumulated stocks. Pittsburg reports a sale of 9,000 tons of Bessemer Pig from the Mahoning Valley for delivery during the balance of the year at $13 75, the lowest on record. There has also been some movement in Bessemer Iron in eastern Pennsylvania. English advices report decreasing stocks.

TIN—The market for both pig and plate is quiet, with concessions necessary to force sales. The consumption was much larger than bad been expected, owing to an increased pack of fruit. The *Iron Age* reports the New York market as follows: "The market has been a remarkably steady one, although not free from the influence of manipulations by leading foreign operators and their local cohorts. As a redeeming feature it is worthy of record that more tin has been taken for regular distributive trade by local and out of town jobhers, and the movement into the channels of consumption is represented as having heen very fair also, the presumption from which is that the metal is considered by many as being a reasonably safe purchase under 20½c. cash, for near future delivery."

COPPER—The market, which has been heavy and more or less lifeless at the East, and also ahroad, has shaded off. New York advices report a dull market, with quotations hard to maintain. English advices to August 24, report as follows: Copper has undergone very little change. The unfavorable statistical position, together with the condition of the silver market, seems to have checked speculative interest, and weak advices from the Continent have also had more or less unfavorable effect. Business with consumers has, however, been somewhat larger.

COAL—Receipts the past week aggregate as follows: Departure Bay, 3,180 tons; Tacoma, 4,700; Philadelphia. 100; Coos Bay, 450. Total, 8,430 tons. The market has ruled fairly steady, although the yards are only fairly well filled, yet there does not appear to he any signs of an early advance io prices. This is doubtless due to an increase in the list of vessels loading at and on the way from Australian ports, and the large quantity on the way from Europe. The coast mines are prepared to largely increase their output. The consumpt on with us is not as large as had been expected.

Mining Share Market.

SAN FRANCISCO, Sept. 1, 1892.

The Comstock mining shares were more lively the past week than at any time this year. The taking up of an unexpected stock as a leader, making it double its value in a mysterious way, then letting it remain quiet while making another stock active, strong and higher, are incentives which will naturally draw in habitual gamblers, but for investors the moves, while offering some inducements, do not possess the attraction they formerly had; for hitter experience has taugbt that in a game where it is hullion for insiderings and assessments for outsiders, it is, in the end, a losing game. The lessoos of the past have made it a certainty that when a sufficient number of gudgeons buy on promises which are as unlikely to prove true as that a pot of gold will he found at the end of the rainbow, they will find it is a down market, with assessments until the outside is frozen out and the rings get the shares for a great deal less than the collected assessmeots aggregate. It is time enough for the public to take a hand at the game when there is a prospect of the mines being worked and the ore milled according to the laws under which the companies incorporated. The inside ostrich trick of hiding the bead while exposing the body, does not deceive, and until they put others to the front, as reformers, than those who have been closely connected with the rings, the public bad better keep a close eye to the wiodward. The writer will place himself on record, as he has repeatedly done, on the upmoves made within the past five years, hy affirming that when the rings have peddled out a sufficient number of shares, there will follow the usual low range of values—60 to 80 per cent helow the highest figures reached. Of course, the old stale cry of big honanzas and something big near at hand in the share market will he the allurements to keep gudgeons, when in the net, from pocketing what loss or profit, as the case may he, they bave met, and not take the certainty of heavy losses. While raising a warning cry at this early day against the game as now thrivingly carried on, yet the writer tbinks that the ring will have to send the market somewhat higher, before it can induce gudgeons, through their cappers and paid newspaper writers, to load up.

The Reno, Nevada, papers announce the arr'val of concentrates at that place from one or more of the Comstock mines. These concentrates, which are reported very rich and assaying several hundred dollars per ton, are to be smelted at the Reno reduction or smelting works. The question naturally arises: Who will get the hullion? Will it go to the mines to which the concentrates belong, or will it get, as has heretofore been reported the case, into pockets of members of the mill ring? Here is a chance for the mining stock association, and the opportunity should not he allowed to pass. Perhaps the seemingly accidental finding out of the trick may cause the managers to be honest, for this time at least, and turn the bullion over to the mining companies to which it is claimed it rightfully beloogs.

What has become of those reported inside reformers—Wells, Zadig and Hirschfeld? Perhaps they are trying to save 50 cents to the mining companies while allowing the mill rings to get away with $50. Of course, a great hue and cry is made ouer the fact that 50 cents is to be saved, while tha

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Belle Isle M Co, Nevada	15	10c	Aug 22, Sept 26, Oct 20		J W Pew, 310 Pine
Bess & Belcher M Co, Nevada	52	25c	Aug 17, Sept 22, Oct 13	L Osborn, 309 Montgomery	
Bullion M Co, Nevada	24	25c	Aug 11, Sept 16, Oct 4	R K Grayson, 331 Pine	
California Verde Antique Marble Co, Cal	2	1c	July 12, Aug 23 Sept 12	W J Oneal, 3 8 Pine	
Challenge Cons M Co, Nevada	12	10c	Aug 24, Sept 27, Oct 18	C L McCoy 331 Pine	
Confidence M Co, Nevada	21	50c	Aug 13, Sept 15, Oct 6	A S Groth 4 4 California	
Crocker M Co, Arizona	12	5c	Aug 11, Sept 20, Oct 18	A Waterman, 3 9 Montgomery	
Crossbow M Co, California	1	1c	Aug 4, Sept 12, Oct 3	H D Walker, 309 Montgomery	
Del Monte M Co, Nevada	5	10c	July 25, Sept 3, Oct 5	J W Pew, 310 Pine	
Evening Star M Co, California	5	1c	Aug 19, Sept 21, Oct 8	J J Scoville 320 Sansome	
Exchequer M Co, Nevada	33	10c	July 27, Aug 31, Sept 20	C E Elliott, 309 Montgomery	
Florida Hill M Co, Idaho	4	3c	July 29, Sept 2, Sept 28	R K Grayson, 331 Pine	
Gold Mt M Co, California	3	82	July 16 Aug 20, Sept 8	J F Curtis, 325 Montgomery	
Golden Fleece Gravel M Co, California	17		July 16, Aug 24, Sept 30	W J Gleason, Phelan Block	
Grover M Co, California	3	10c	July 28, Sept 1, Sept 23	R McF Doyle, 15 Fremont	
Guasacan & California M Co, Honduras	7	$1.50	Aug 9, Sept 15, Oct 8	E Oliver, 22 Mint Avenue	
Hale & Norcross M Co, Nevada	101	50c	Aug 11, Sept 15, Oct 7	A B Thompson, 309 Montgomery	
Ida Elmore Con M Co, Nevada	17	5c	Aug 15, Sept 23, Oct 13	J W Pew, 3 0 Pine	
Justice M Co, Nevada	51	10c	July 26, Aug 31, Sept 19	R Kelly, 419 California	
Kentuck M Co, Nevada	4	10c	July 1, Aug 13, Sept 8	J W Pew, 310 Pine	
Keystone Con M Co, California	5	$1	Aug 27, Sept 24, Oct 18	J B Isham, 310 Pine	
Mountain Tunnel M Co, California	5	7c	July 28, Aug 27, Sept 26	E C Lander, 219 Sansome	
Navajo M Co, Nevada	22	10c	Aug 17, Sept 21, Oct 14	J W Pew, 310 Pine	
Northwestern G M Co, British Columbia	5	20c	Aug 17, Sept 25, Oct 15	F Bonselna, 438 California	
Peer M Co, Arizona	13	10c	July 19 Sept 8, Oct 6	A Waterman, 3 9 Montgomery	
Pearl M Co, Arizona	18	5c	July 8, Sept 4, Sept 20	A Waterman, 309 Montgomery	
Scorpion M Co, Nevada	28	6c	July 11, Aug 14, Sept 12	G R Spinney, 310 Pine	
Silver Hill M Co, Nevada	31	5c	Aug 2, Sept 6, Sept 27	D O Bates, 309 Montgomery	
Silver King M Co, Arizona	9	25c	Aug 26, Oct 7, Nov 4	J W Pew, 310 Pine	
Ter ia M Co, Mexico	8	10c	Aug 19, Sept 22, Oct 8	K J Willat, 309 Market	
Union Cons M Co, Nevada	40	20c	July 18, Aug 24, Sept 13	A W Barrows, 303 California	
Western Star M Co, California	1	2c	July 25, Aug 30, Sept 21	J A Reed, 328 Montgomery	

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
El Dorado Slate Co, California	Annual	R M Welch, 3 3 California	Sept 9
Gold Mountain M Co, California	Annual	J F D Curtis, 325 Montgomery	Sept 9
Grand Prize M Co, Nevada	Annual	R R Grayson, 331 Pine	Sept 20
Mono G M Co, California	Annual	H D Walker, 309 Montgomery	Sept 15

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Sulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	15	T Wetzell, 310 Pine	Aug 18
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Sept 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

$50 is lost sight of. It is a great game, this of working the Comstock mines.

An exchange says: "I want to see an improvement in the Comstock," said James L. Flood. "I don't care where it comes; whether it is in any of the mines under my control or in those managed by other people, for no matter where it should be, it will help the whole lode and revive the stock business." These remarks are characteristic of Mr. Flood and show his unselfish disposition " Of course, Mr. Flood, like other mining magnates, works for the innocent lambs of the street, and their unselfishness is probably only equaled by that of the wolf's unselfishness looking after the sheep during the absence of the shepherd.

During the prevailing depression in the mining-share market, the outside mines have been lost sight of. It is said that the numerous assessments have driven a large number (in some cases over one-half) of the shares in such mines into the company's office—bought in for assessments. It is said that when more are secured in this way, and the rings have bought them from the companies, then we are to be treated to a big boom in outside mining shares.

The news from the outside mines is generally of a very favorable character, and it is claimed that if the mines were honestly worked several would be paying dividends instead of collecting assessments.

Public advices from the Comstock mines are more favorable. What the MINING AND SCIENTIFIC PRESS has stated regarding the work in the mines, is now allowed to leak out through the press, but there is much more yet to be told provided the inside can not induce the buying of shares so as to collect assessments while looting the mines. There is not the least doubt but one or more bodies of rich ore are being thoroughly developed to the west, but it is equally as certain that under the present system of working the mines and milling ore, the outsiders will only get the proverbial stone while crying for bread. A Virginia exchange reports very important improvements in Con. Virginia, a better showing in the joint west cross-drift of Sierra Nevada and Union, an improvement in Hale & Norcross, and an improvement in Belcher, but they neglect to give the more important improvements in other mines; perhaps this is kept back so as to get the public to buy stock if what has been said fails. It is now claimed that pumping out of the Gold Hill mines is to be resumed and prosecuted to an early finish. This means assessments, or, if the shares in the Gold Hill mines are peddled out, the pumping machinery may break and the mines be again flooded. It is a great game, the working of the Comstock mines.

San Francisco Metal and Coal Market.

ANTIMONY.			STEEL.		
Per lb	—	@ 14	English, lb	—	@ 18
BORAX.			Canton tool	—	@ 8½
Refined, in car lots	—	@ 7½	Sl'k Diam'd tool	8½	@ 16
Powdered, do	—	@ 7½	Pick & Hammer	7½	@ 10
Concentrat'd, do	—	@ 6½	Machinery	4	@ 5
All grades jobbing at advance.			Toe Calk	—	@ 4½
COPPER.			TINPLATE.		
Bolt	22	@ —	B. V. steel grade		
Sheathing	22	@ —	14x20, spot	—	@ 8 00
Ingot, jobbing	—	@ 14½	Charcoal, 14x20	—	@ 8 00
Do, wholesale	—	@ 15½	Do roofing, 14x20	—	@ 6 00
Fire Box Sheets	22	@ 24	Do, do, 20x28	—	@12 00
IRON.			PIG TIN.		
Bar, base	—	@ 3	Spot, lb	—	@ 23½
Norway, base	—	@ 4½	COAL.		
PIG IRON.	Spot.		SPOT FROM YARD—PER TON.		
Eglinton, ton	22 00@	—	Wellington	$8 00	
Glengarnock	23 00@	—	Nanaimo	7 00	
Am. Soft, No. 1	24 00@	—	Gilman	5 00	
Oregon Pig	—	@ —	Seattle	5 50	
Puget Sound	—	@ —	Coos Bay	5 50	
Clay Lane White	24 00@	—	Cannel	8 50	
Langloan	22 00@	—	Egg hard	11 50	
Thorncliffe	23 00@	—	Cumberland, in sacks	14 00	
Gartsherrie	22 00@	—	Do, bulk	13 00	
Barrow	22 00@	—	Wallsend	7 00	
Carnforth	22 00@	—	Scotch Splint	7 00	
CHROME IRON ORE.			Brymbo	6 75	
Per ton	10 00 @	—	West Hartley	7 50	
LEAD.			TO LOAD—PER TON.		
Pig	—	@ 4½	Australian	5 75	@ —
Bar	—	@ 6½	Liverpool Steam	6 00	@ —
Sheet	—	@ 7	Scotch Splint	5 00	@ —
Pipe	—	@ 6½	Cardiff	5 25	@ —
SHOT.			Lehigh Lump	12 00	@ —
Drop, sizes *smaller* than B, ⅜ bag of 25 lbs		$1 85	Cumberland	9 00	@ —
Do do, B and *larger* sizes ⅜ bag of 25 lbs		2 10	Egg, hard	10 00	@ —
Buck, Balls and Chilled do, ⅜ bag of 25 lbs		2 10	West Hartley	6 50	@ —
QUICKSILVER.			COKE.		
Home trade, pr. flask	41 60	@42 00	English, to load	$8 00	@ 9 00
For export	35 50	@38 00	Do, spot, in bulk	—	@10 00
			Do, in sacks	—	@12 00
			Cumberland	9 00	@ —

Eastern Metal Markets.

NEW YORK, Aug 31.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38 1-16	83	11 50	4 05	20 40
Friday	38½	83⅜	11 50	4 15	20 45
Saturday	38½	83⅜	11 50	4 10	20 45
Monday	38½	83⅜	11 50	4 10	20 40
Tuesday	38	82⅞	11 40	4 15	20 35
Wednesday	38⅛	82½	11 40	4 15	20 30

Quicksilver is easy at the late decline. Borax is weaker. Pig tin is weaker in sympathy with the decline in silver, and slower movement abroad. Pig lead is stronger under manipulation. Copper is shading off owing to light call from abroad.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING AUG. 23, 1892.

481,383.—BORING MACHINE—G. A. Adams, Santa Clara, Cal.

481,476.—BICYCLE—W. S. Cranmer, Sonoma, Cal.

481,168.—VISE, PIPE TONGS, ETC.—John Ellis, Stockton, Cal.

481.391.—RECOVERING WASTE PRODUCTS OF PETROLEUM—J. P. Engle, S. F.

481,392.—SEPARATING WASTE PRODUCTS OF PETROLEUM—J. P. Engle, S. F.

481,183.—WASHING MACHINE—S. P. Lowell, Eugene, Or.

481,507.—STEAM TRAP—J. McKellar, S. F.

481,411.—HYDRAULIC LIFTING DOCK—Robert Moran, Seattle, Wash.

481,424.—PILLOW SHAM HOLDER—A. J. Robberson, Napa, Cal.

481,427.—LIFE-SAVING CRAFT—A. B. Shearer, Reno, Nev.

481,439.—PNEUMATIC ELECTRIC CIRCUIT CONTROLLING AND INTERLOCKING APPARATUS—Slater & Barnes, Oakland, Cal.

481,312—OIL CUP—J. T. Smith, S. F.

481.214—NUT LOCK—A. Warenskjold, San San Diego, Cal.

481,541.—ROOFING AND SIDING—Jas. Winslow, S. F.

The following brief list by telegraph, for Aug. 30, will appear more complete on receipt of mail advices:

California.—Rawdon Arnold, Sacramento, ice-pitcher; Ulrich Bachman, Mission San Jose, impregnating liquids with gases; Pierre Bourgin, Oakland, bean-thresher; John E. Chappell, San Francisco, laundry drying-room; Parker Crittenden, San Francisco, can-labeling machine; Arthur B. Cruikshank, San Francisco, fire escape; Michael Dillenburg, San Francisco, air-compressor; Samuel Hamilton, King City, threshing cylinder; Jefferson Kindleberger, San Diego, car-coupling; Henry Mathey, South Riverside; reverberatory smelting furnace; John F. Myers, San Francisco, cooking, heating and illuminating lamp-stove; John Richardson, San Francisco, saw filing and setting machine; Ira W. Schofield, Jr., San Francisco, air supply for boiler furnaces; Arthur T. Snell, Ventura, safety pin; Samuel D. Sturgis, Jr., and F. F. Peck, Pratt, game-counter; Edward L. Ward, Santa Rosa, plow.

Oregon.—Andrew J. Coffee, Portland, fire alarm telegraph; Leonard Forsman, Albina, drag-sawing machine; John W. Todd, Portland, saw-tooth.

Washington.—Martin A. Brown, Seattle, toilet paper-holder.

Arizona.—Paula J. Johnson and J. H. Hamill, Globe City, calendar attachment for time-piece.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ROOFING AND SIDING.—James Winslow, S. F. No. 481,541. Dated Aug. 23, 1892. This improvement in covering the sides and walls of buildings consists of a series of overlapping metallic, glass, composition or other plates or shingles having raised ribs or configurations by which the rigidity of the shingle is increased, and a novel means of attaching and securing these plates. These plates or shingles may be made of galvanized iron or other sheet metal, or any composition possessing the necessary qualities of rigidity and permanence. In case the longitudinal corrugations or ribs are not desired, symmetrically raised figures may be stamped upon them, these ribs or figures serving to stiffen the plates, and those which are adjacent to the edges being symmetrical in shape will overlap and fit those of the next adjacent plates, thus allowing the plates to lie closely upon each other while at the same time they are greatly stiffened and strengthened. In stamping and corrugating these plates the inventor gives them a slight curvature from top to bottom so that they will present a concave face toward the wall of the building.

BICYCLE.—Wm. S. Cranmer, Sonoma. No. 481,476. Dated Aug. 23, 1892. This is one of that class of bicycles in which an endless chain is employed to transmit the power of the crank-shaft to the driving-wheel. It consists in a bicycle, the rear or driving wheel of which is made larger in diameter than is usual in this class of machines, and said wheel is driven by two endless chains, one on each side, said chains receiving their power from independent crank-axles located back of the driving-wheel front, thus enabling the saddle of the machine to be set as far back as may be desired. The object of the invention is to provide a bicycle of this class with a large driving-wheel, and by reason of the particular arrangement of its driving connections, provide for the setting back of the saddle as far as may be desired, in order that the weight of the rider may be borne by the two wheels, in proportion to their size.

PILLOW-SHAM HOLDER.—A. J. Robberson, Napa, assignor of one-half to J. W. Hosteller. No. 481,424. Dated Aug. 23, 1892. This is one of that class of holders for pillow-shams in which a movable bar carries the shams and is attached to the head-board in such a manner that it can be depressed to allow the shams to fall over and cover the pillows when the latter are not in use, and is raised to lift the shams clear of the pillows and hold them out of the way when not required. The object of the invention is to connect and support the bar from the head-board by simple devices, which present a neat appearance and which are of such a character that the bar can be fitted to the head-board, no matter what kind of moldings or cornices it may have.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 10.		WEEK ENDING Aug. 17.		WEEK ENDING Aug 24.		WEEK ENDING Aug. 31.	
Alpha	.15	.20	.15	....	.15	.15	.15	....
Alta	.30	....	.25	....	.25	.20	.20	.30
Andes	.35	....	.30	.35	.30	.25	.30	.40
Belcher	.90	.95	.80	.90	.45	.35	.80	1.45
Belle Isle	....	....	.10	....	.05	....	.10	....
Best & Belcher	1.30	1.50	1.30	1.40	1.30	1.05	1.10	1.40
Bullion	.30	.35	.20	.25	.25	.10	.15	.25
Bodie Con	.30	....	.25	.30	.25	....	.30	....
Bulwer	.40	....	.30	....	.30	....	.25	....
Commonwealth	....	....	.10	....	.10	....	.05	....
Con. Va. & Cal	3.20	3.50	3.30	3.45	3.30	3.00	3.15	3.40
Challenge	.35	....	.25	.30	.25	.20	.20	.35
Chollar	.55	.65	.50	.60	.50	.40	.40	.60
Confidence	1.35	....	....	....	....	....	.90	1.35
Con. Imperial	....	....	....	....	....	....	.05	....
Caledonia	....	....	.15	....	.15	....	.15	.25
Crown Point	.55	.60	.60	.6	.55	.40	.45	.80
Crocker	....	....	....	....	....	....	.05	....
Del Monte	....	....	....	....	.05	....	....	....
Eureka Con	1.50	1.60	....	....	2.00	....	....	....
Exchequer	.05	.10	.05	....	.05	....	.05	.15
Grand Prize	....	....	.05	....	....	....	....	....
Gould & Curry	.80	1.05	.85	.85	.85	.65	.65	.95
Hale & Norcross	.85	1.05	.75	1.00	.75	.45	.65	1.25
Julia	....	....	....	....	.05	....	....	....
Justice	.10	....	.05	....	.06	....	.06	.20
Kentuck	.05	....	.05	....	....	....	.15	....
Lady Wash	.10	....	....	....	....	....	....	....
Mono	....	....	.15	....	....	....	.15	....
Mexican	1.30	1.45	1.20	1.30	1.20	1.05	1.05	1.40
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	....	....	....	....	.05	....	.05	....
New Queen	.20	....	.20	....	....	....	.15	....
Occidental	.30	.45	.40	.45	.40	.30	.30	.40
Ophir	2.15	2.40	2.15	2.40	2.15	2.00	2.05	2.45
Overman	.25	.30	.25	.30	.30	.25	.30	.45
Potosi	.50	.80	.45	.65	.45	.35	.40	.65
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	.10	....
Savage	.90	.95	.65	.95	.70	.55	.60	.90
S. B. & M	.20	....	.20	....	.15	....	.20	.30
Sierra Nevada	1.05	1.35	1.05	1.30	1.06	.90	.90	1.50
Silver Hill	.05	....	....	....	....	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.80	1.05	.75	1.00	1.06	.75	.85	1.30
Utah	.20	.25	.20	.25	.20	.15	.25	.30
Yellow Jacket	.60	.60	.50	.65	.50	.40	.45	.75

*Assessment added.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Conrt, Department 10, San Francisco:

OAKLAND AND PIEDMONT ELECTRIC RAILWAY Co. Capital stock, $500,000. Directors—F. H. Meyers, E. S. Denison, W. H. Bailey, W. M. Rank and S. H. Bass. The corporation will soon commence the work of transforming the Meetz-streetcar line to Alameda into an electric road.

OAKLAND SASH AND DOOR Co. Capital stock, $25,000. Directors—T. L. Hierlihy, E. C. Bridgman, W. A. Boscow, C. A. Taber and J. McCnlly.

SANTA CRUZ ELECTRIC RAILWAY Co. Capital stock, $500,000 in 5000 shares. Directors—J. P. Smith, J. H. Horgan, F. W. Ely, W. H Talbot, Morris Newton, H. H. Clark and J. G. Tanner. The presumable purpose of the new incorporation is to absorb both the Pacific Avenue Street Railway Co. and the Santa Cruz, Garfield Park and Capitola Electric Railway Co., and all railway lines in Santa Cruz that may ultimately come under the electric system.

Assessment Notices.

NOTICE OF ASSESSMENT.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Amador City, Amador County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of August, 1892, an assessment, (No. 3) of One Dollar ($1) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room 43, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 18th day of October, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. H. ISHAM, Secretary.

Office—No. 310 Pine Street, Room 43, San Francisco, California.

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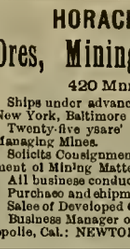

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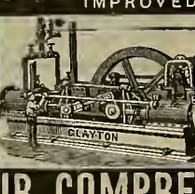

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST BORAX COMPANY. San Francisco, August 31, 1892. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 21) of One Dollar ($1.00) per share was declared, payable SATURDAY, September 10, 1892, at the office of the company, No. 191 Sansome Street, Room 26. Transfer books will close September 5, 1892, at 3 o'clock, P. M.

ALTON H. CLOUGH, Secretary.

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A first-class millman and gold and silver amalgamator desires a situation. Has had charge of four mills, and has worked in many more. Can give best of references and recommendations from former employers Parties who are likely to want a millman would do well to correspond. Address, "E. M.," Station A., Los Angeles, Cal.

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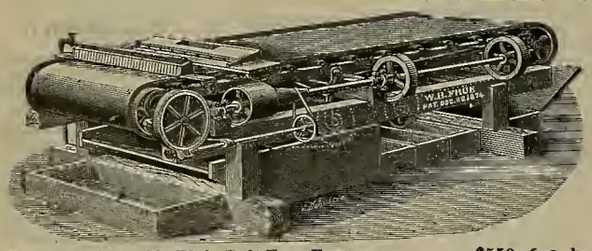

SAN JACINTO ESTATE, LIMITED,
Office of General Manager,
P. O. Address, South Riverside, San Bernardino Co., Cal.
CAJALCO, Dec. 18, 1891.

MESSRS. ADAMS & CARTER, 132 Market Street, San Francisco, Cal.—GENTLEMEN: After a continuous trial of different concentrators comprising the Frue Vanner, the "Holland," "Paradox," "Triumph" and the "Woodbury" concentrators), extending over several months, we find that we prefer the Frue Vanner, as it is easier of adjustment, runs smoother, has less wear and tear, and—having a positive travel—gives less trouble than the other more complicated and ever changing machines now in use here. The Frue Vanner not only saves a cleaner concentrate, but has less loss in the tailings, and is in several ways preferable to the other concentrators here.

I am, my Dear Sirs, Yours faithfully,
S. HARRIS, Manager.

For any information, or for pamphlets, or for circulars or testimonials, call on or address

Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
" " " Improved Belt Frue Vanner ..... 800, f. o. b.
" 6 foot " Plain Belt Frue Vanner..... 800, f. o. b.

H. J. SUMMERHAYES, Successor to Adams & Carter, Agent for the FRUE ORE CONCENTRATOR,
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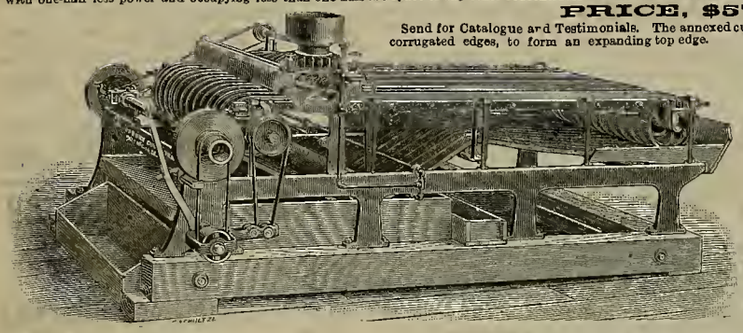
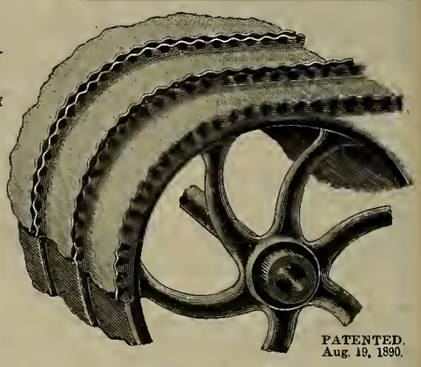
Send for Catalogue and Testimonials. The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge.



THE SAN JACINTO ESTATE—Office of the General Manager. CAJALCO, Oct. 30, 1891.
GEO. E. WOODBURY, ESQ.—Dear Sir: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" Concentrator placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the concentrates equally clean, as from either of the machines at work here
[Copy] Yours faithfully, S. HARRIS, Manager.

THE SAN JACINTO ESTATE, LIMITED—Office of General Representative, P. O. address, South Riverside, San Bernardino County.
CAJALCO, February 17th, 1892.
GEO. E. WOODBURY:—Your letter of inquiry about your concentrator came to hand in due course. Your machine is doing well, the motion is all right, and the machine is giving entire satisfaction. Yours faithfully
S. HARRIS.



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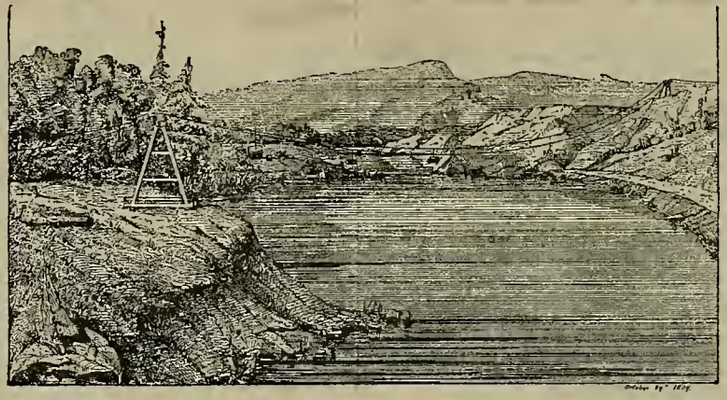

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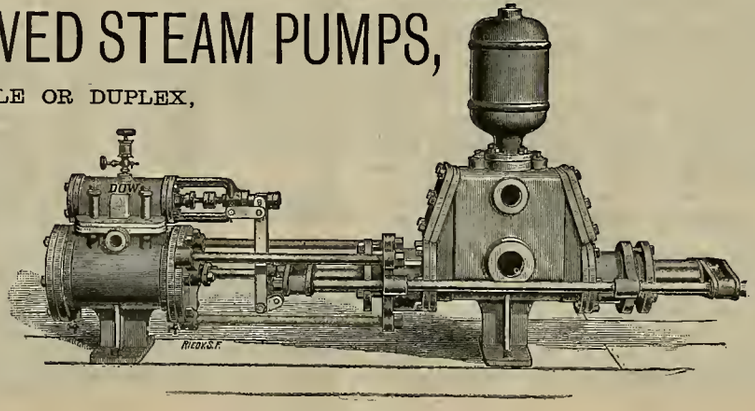

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An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL. LXV. — Number 11.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, SEPTEMBER 10, 1892.

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Recording Proof of Mining Labor.

A subscriber in Peru mining district, Ventura county, writes us that there is a great deal of dissatisfaction in the different mining districts with regard to the law passed by the last California Legislature, compelling miners to record the annual assessment work with the county recorder of deeds at the county seat. Our correspondent thinks it was a bill pushed through by county recorders, which robs the district recorder of his just dues. "It also makes it very expensive for locators in this district, as we have no one before whom to make affidavit nearer than 40 miles, and it is 100 miles to Ventura, the county seat. Then some men have four or five claims here and keep up the assessment work themselves. As the work has to be recorded in 30 days, it causes such men to make four extra trips to the notary public. The law is unfair and we want it repealed."

It must be confessed that the U. S. Mining laws contemplated the recording of locations, proof of labor, etc., with the district recorders of the mining districts, and this still holds in States and Territories which have not passed laws like California. The Land Office provides that where there is no district recorder location notices may be recorded with the county recorder; but this provision shows that the district recorder is preferred. The object of this was plainly to make the matter easy for the miners. In this State, however, there are many very old districts where there are now no district recorders, that work having fallen to the county recorder by custom. In newer districts, where there are many locations being made, the district mining recorder has something to do; but in regions where most of the claims are patented, the office is one which does not pay any one to hold. The object of the new State law was to make it easier to trace titles to mining property, and to obtain proof of the performance of the labor required by Congress. By having these records at one place in a county instead of a dozen or so, the matter of search is easy. Moreover, the county records are kept in good shape and in proper buildings, while district records may be, and often are, kept in a candle-box in a shake cabin; and if the camp runs down and the recorder leaves, the whole records may be lost.

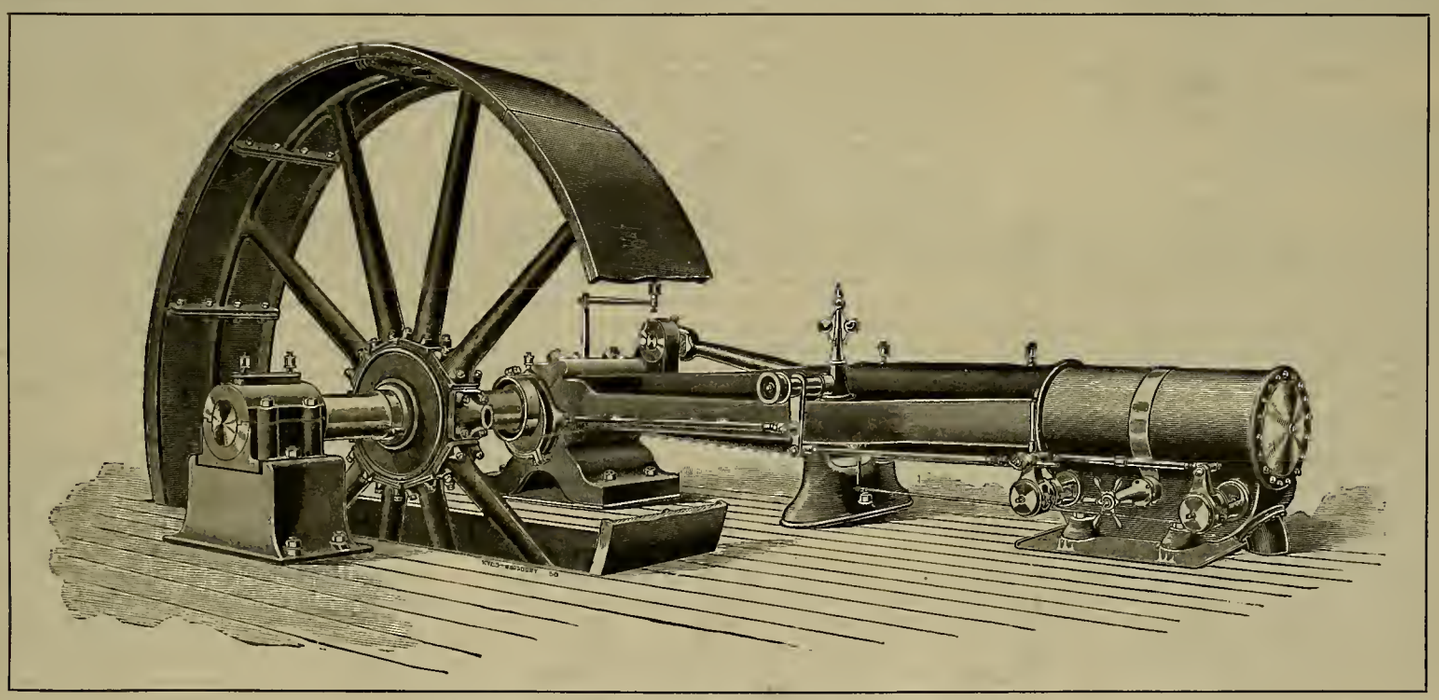
While, therefore, in distant camps the new law may work a hardship on individual miners, it is plain it is a step in the right direction to place mining property on the same footing, as far as records go, as ordinary real estate in the form of ranches, lots, etc. With the county recorder there is no danger of the records of location, proof of expenditure, etc., being mislaid, and any intending purchaser or lender may find out all about the title of any claim in the county. Very naturally there will remain very little, if anything, for the district recorder to do; in fact, there is no need of a district recorder under this law. An officer already having other duties may perform his also. The U. S. Land Office recognizes the record of an affidavit of labor performed as prima facie evidence of its having been done. The California law recognizes the same thing, except that it requires the records to be made with the county recorder.

The comment of our correspondent concerning the necessity of making four or five trips for affiants on as many claims, because the work must be recorded in thirty days, is based on an error of understanding concerning the law. The California law makes no change whatever in the United States law; it only provides that the work required by the Government law shall be recorded with a county instead of a district recorder. As far as recording proof of labor is concerned, unless the district rules provide otherwise, that may be done at any time during the year in which the work is done. The California law says: "Whenever any mine-owner, company or corporation shall have performed the labor and made the improvements required by law for the location and ownership of mining claims, such owner, company or corporation shall file, or cause to be filed, within thirty days after the time limited for performing such labor or making such improvements with the county recorder of deeds of the county in which the mine is situated," etc. Now, this provision does not mean that the work done must be recorded within thirty days from its completion. It means within thirty days after the time limited for performing the labor, which time under the United States laws, is the first day of January of the year succeeding the date of location, and annually thereafter. Therefore, if the work is done at any time during the year on several mines, the records may be made on all within 30 days after the first day of January.

The Hill-Wheelock Engine.

The Hill-Wheelock engine is similar in design to the Corliss, except that the valves are different. It is specially adapted for electrical work, as it can be run 125 to 150 revolutions and be belted direct to a dynamo. The valve was invented by Edward K. Hill, and is of a new form and construction. The valves are made in sets complete, a frame containing the entire valve mechanism. The cut-off and exhaust valve are on one side, and the live-steam on the other side. In the Corliss engine the valves are at the four corners, so to speak; these are at each corner below the piston. These valves are of the gridiron pattern, and it is claimed that they give the greatest port area of any valve system. While the Corliss engine only has a port area of 7½ per cent of the cylinder area, this engine gives about 18 per cent, which permits a full throttle pressure on the piston, putting the engine among the first in rank in economy. The makers of these engines will guarantee to excel other engines five per cent with the new valve. At a recent meeting of the Technical Society of the Pacific Coast this valve-gearing was described and discussed, and the discussion was printed in the proceedings of the society.

Tests made with these improved engines show a very high degree of efficiency and economy. The Risdon Iron Works of this city have been investigating their merits and intend introducing them here. The engines are built at Worcester, Mass., but will be kept on hand for sale by the Risdon works.



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Assessment Notices	$10.00
Delinquent Notices, per square	3.00

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W. B. EWER, CHAS. G. YALE, } .....EDITORS
ALFRED HOLMAN.....MANAGER

Entered at the S. F. Postoffice as Second-Class Mail Matter.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO, SATURDAY, SEPT 10, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

MacArthur-Forrest Process—T. L. Wiswall, Denver, Colo.
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☞ *See Advertising Columns.*

Comment.

More electric railroads are being built and projected in Oakland than in any city on this coast. The city spreads over a large area and extends practically from Fruitvale to Berkeley. It is mainly a residence region and quick transit is demanded from the stations on the steam lines which connect with the ferry system. This accounts for the desire to obtain franchises for electric roads. One has been asked for on High street, Twenty-seventh avenue, East Sixteenth street, Park street and other streets in Brooklyn township, and to this many property-owners object. The protestants give the following as their reason: "Nearly every street in the immediate vicinity of the property where we reside and of large sections of territory to and from which we travel is already obstructed by various kinds of street railroads, and in this connection we have to say that the country is so well occupied and supplied by street railroads that there is no necessity for the construction of another street railroad over the last-named streets. Julia, Howard and Park streets are now lined on either side with shade and ornamental trees. The construction of said street railroad would necessarily result in the destruction of nearly all of the trees and thus mar the beauty of the streets." Speaking of street railroads as "obstructions" is rather odd in a growing town, but the fact is that in Oakland, as in other places, too much latitude is allowed the companies. No sooner is a fine street put in first-class condition than it is torn up for a street railroad of some kind, and in many instances the property-owners do not wish it there at all. As a general thing they want to see it on some one else's street. While a convenience a block or two away from a residence, an electric road in front of one's house is not desirable. There is no ordinance in that city requiring guard wires on the power wires of the roads, but there should be at once. In eastern cities these are required everywhere. If the electric companies wish to keep in favor with the public they should put every safeguard around their plants, and this is a simple and important one. The organized opposition to this projected road is, however, on the ground that a fine street is to be spoiled, it being the general experience that the companies never put the street back in the same order they found it. It is pleasant, however, to note an exception in this respect. The Sixteenth street electric road, from the narrow gauge depot to Fourteenth street depot, was built on good streets, but the space between their tracks is as well paved as that prepaved by the property-owners. If this course were always pursued there would be less opposition to the building of new street railroads.

The gold output of the Witwaterstrand mines in South Africa for the month of July amounted to 101,279 ounces, as compared with 54,920 ounces for the same month of 1891, but a falling off of 1973 ounces from the June product of the present year, which was 103,252 ounces. The output for the first seven months of 1891, however, amounted to but 377,583 ounces. For the same period of this year the total has increased to the satisfactory aggregate of 663,893 ounces, which is an increase of 286,310 ounces, or about 50,000 ounces of gold more than was produced in the whole of 1888, when the Rand mining industry was in its infancy. This is an immense output from one camp. The annual product of these mines now exceeds that of the whole State of California, and this State still produces more gold than any other in the Union. South Africa is doing better in gold production than any part of Australia or the United States.

The old Anti-Debris Association is about to go out of business, as a new one is to be formed to take its place in keeping up the debris agitation. Mr. C. E. Stone, the president, read a report at the recent meeting in which he stated that owing to laws enacted by the last Legislature, and to changes made in the office of the U. S. District Attorney, the directors had been unable to carry on litigation against hydraulic-mining as vigorously as they desired. He did not state, however, that there was a change of sentiment on this whole subject, and that the people and the press of California want to see hydraulic-mining resumed, and that, in consequence, the Anti-Debris Association no longer had the influence it formerly had. Mr. Stone says that the opposition of the Anti-Debris Association to the Caminetti bill defeated it in the Senate; and that the passage of the bill would "annul the decision already made and allow every monitor to resume its work of destruction." How foolish it is to continue with such misrepresentations! No good is accomplished by any such statements. It is perfectly well-known that the Caminetti bill is based on the reports of the U. S. engineers, and it is not intended that any mine may start unless provision is made for keeping the debris out of the rivers. The provisions of the bill require that each mine must be licensed, and licenses cannot be obtained unless it can be shown that restraining works, satisfactory to the Government engineers, have been built. This surely will not "allow every monitor to resume its work of destruction." In fact, the miners themselves think the bill is too severe upon their industry and that only large claims can comply with its provisions. The fact is, the miners' side of this controversy is now being given a hearing by the people and by Congress, and the Anti-Debris Association has had its own way so long that its directors do not like to "let go." If the miners can impound their debris they will be permitted to work; if not, they must keep their mines closed down. But there is no doubt that the Caminetti bill, or some other like it, giving the miners a chance to try the dams, will pass at the next session of Congress.

A. Maltman, agent at Nevada City, for the Portland Smelting and Refining Co., shipped over 200 tons of sulphurets last month to Portland, Oregon, and expects to ship a larger amount this month. He is ready to buy all offered, paying the highest price for them. It is a new thing to ship sulphurets from this State to Oregon. It is stated that the iron is utilized to good advantage by the Portland works, making the sulphurets more valuable to them than to others; hence the price paid. These works would move to some point on San Francisco bay could they make a satisfactory freight rate from Grass Valley and thereabouts to this city. The railroad companies, however, would make no concessions such as have been made by the Northern Pacific to the smelting companies. It is good, however, to find an active demand for sulphurets, from whatever source. Nearly all the gold mills of this State produce more or less sulphurets and these concentrates are generally sold to the chlorination works or smelting companies. Few mines have their own chlorination works, it being only very large companies which do this work themselves.

While local consumers of California quicksilver pay $42 per flask for it, the metal is sold to exporters for $36 per flask. All that goes to China or Australia is therefore sold by producers and dealers for a less price than they charge California gold and silver miners. The duty on the foreign import of the metal is what permits this difference in charges. At the same time, "American goods returned" from these countries pay no duty. Some one in this city dropped on this recently, and when the Monowai came from Australia the other day, she discharged, among other things, 100 flasks of quicksilver, marked as "American goods returned." Somebody had bought these flasks at export rates, shipped them to Sydney, and had them returned here in another name. The freight and handling cost about $150, leaving a profit of $4 50 per flask to the shrewd buyer who can undersell the dealers in the market. Of course the men who handle the bulk of the product of the State will try and prevent this being done if they can, but this is the second instance of the kind.

The establishment of the new lines of clipper ships between this city and New York, for the benefit of merchants here, will be likely to result in some benefit to the miners as well. One of the ships of the new line sailed from this port to New York last Saturday, and part of her cargo consisted of 106 tons of lead, 61 tons of copper matte, and 2020 centals of borax. With a still further reduction in freight rates East, more mineral products would be shipped. The chrome industry of California can only be carried on during the times of low freights. When freight rates are normal, very few mines are worked; but on any occasion when they drop, numbers of deposits are opened and the product shipped. Thousands of tons could be produced here annually if it did not cost so much to bring the ore to market. The miners have received no encouragement from the railroad companies. If the managers of the shipping lines around Cape Horn will stick to a low freight rate to New York, numbers of mines now idle here will be started up again.

At the last meeting of the Academy of Sciences, E. W. Jones, superintendent of the smelting department of the Temescal tin mines, San Bernardino county, exhibited samples of ore, slag, concentrates, refined tin, etc., from the mine and explained the system of working the ore. The specimens exhibited were unusually rich in tin, containing from 8 to 40 per cent of the pure metal. Under the questioning of Theodore H. Hittell, the superintendent admitted that the ore now being worked at Temescal is not near as rich as the specimens shown. The Cornwall mines, however, contain but 2 to 4 per cent of the metal, he said, and are worked with profit, "but no comparison could be made between the two mines, as in Cornwall the deposit is enormous and the labor cheap, while in Temescal the ore exists only in pockets and labor is very high." It may be added to these remarks that very rich specimens are also found in the Cornwall mines, some of them nearly pure tin; but the large deposits of ore run in low grade. The same will doubtless be found to be the case at Temescal. The rich specimens are not abundant. With a large deposit of ore, 4 per cent of metal would make the Temescal mine a larger producer than it is at present. It is to be hoped that the pockets of high-grade ore will be numerous in this California mine, but thus far it must be confessed the amount of production of metal is much less than was expected from it.

The cholora reports grow worse and warse. In Russia the deaths during the past week have numbered about four thousand per day and the plague, which at first was confined almost exclusively to the poorly-fed and poorly-boused peasants, is attacking the middle and upper classes. All hope of checking it is past and the stricken people can only wait and pray for the coming of frost. The disease is rapidly spreading in western Europe, but has not yet become epidemic anywhere except in Hamburg. There the situation is indeed deplorable. The death-rate is now about two hundred per day and is increasing with frightful rapidity. Business is suspended and all who can get away have fled from the stricken city. There is not a considerable city in Europe which is not in danger of just such a scourge. At London, Manchester Glasgow Antwerp, Bremen, Brussels, Havre, Paris—in every city of western Europe, in fact, there are a few cases. Every possible care is taken to prevent contagion, but, in spite of all, the disease slowly and steadily spreads and the danger of universal plague is very serious. The dread disease reached this country on Thursday of last week, brought from Hamburg by the immigrant ship "Moravia." In her passage of thirteen days there had been twenty-two deaths, and at the time of her arrival two persons were sick. Both have since died. The arrival of the cholera at our own doors was the occasion of immediate alarm. The infected ship was sent to quarantine and strict measures adopted to prevent the landing of other ships from Europe. The President, who was visiting Whitelaw Reid at the latter's farm in New York State, hastened to Washington, and on the following day a proclamation was issued by his authority ordering that "no vessel from any foreign port carrying immigrants shall be admitted to enter at any port of the United States until said vessel shall have undergone quarantine detention of 20 days, unless such detention is forbidden by the laws of the State or regulations made thereunder, and of such greater number of days as may be fixed in each special case by the State

authorities." Under this order, the ports of the Atlantic coast are now closed against immigrant ships and against all ships from European ports until careful inspection has demonstrated that they are free from disease. Since the order was issued, a number of other vessels have arrived, some with cholera on board. Thus far, however, there have been no cases on shore in New York, and the quarantined vessels are closely guarded to prevent any one leaving them. The principal cities of the United States are preparing for the advent of the dread disease, and a general cleaning up is going on under direction of the Boards of Health. It is not to be denied that not only New York but all the United States is in imminent danger. The most favorable circumstance is that winter, with its salutary frosts, is not far off.

Foundry Notes.

THE new fire tug for the State Harbor Commissioners was launched on Tuesday at Sixth and Channel streets. She was built by Hinckley, Spiers & Hayes of the Fulton Iron Works and is named the Governor Markham. The tug is 84 feet in length over all, nineteen feet in beam and has a depth of hold of ten feet. She has compound engines, with 16 and 26 inch cylinders, with a 24-inch stroke. She has two Dow fire pumps, throwing eight streams, and having a capacity of 50,000 gallons an hour. The tug is to take the place of the old Anasha, and cost $22,475. The vessel is used not only as a fire-boat, hut as a tug for towing the mud barges from the State dredgers, on the water-front.

KNIGHT AND COMPANY of Sutter Creek, Amador county, have got a contract for building a hydraulic engine and pumping machinery for the Clinton Consolidated mine. The pumping capacity of the engine is to he 2,000,000 gallons in 24 hours. They have also been awarded the contract for putting up a 3½ feet friction hoist at the Hurley mine, West Point. The work above mentioned, and what they have already done in their shops, will necessitate putting on an additional force of men, and keep them busy tbe remainder of the season.

THE Joshua Hendy Machine Works baving their office at 51 Fremont street, and works on the block bounded hy Bay, Kearney and Francisco streets, have at least sixty men constantly employed. Among their specialties is architectural iron| work. In this line they supply a large amount of columns, trusses and such other parts as enter into the construction of modern buildings, furnishing them not only to this city, but other parts of the State. They also build the Challenge ore feeders which still retain their supremacy, and are placed in most of the new mills.

The Triumph ore concentrators also form an important part of their manufactures. Considerable attention is being paid to horse hoists or whims, ore cars and ore buckets, which are of exceedingly good patterns and well adapted for the uses for which they were designed. The Hendy works are using their best endeavors to introduce the new form of band-saw mill which is displacing the old circular saws on this coast, as it has elsewhere. Having worked well on the mixed timber of the southern States, it does even better on the redwoods of California.

GEOLOGICAL MAP.—The United States gelogical survey has been for ten years engaged in making a great map of the United States, parts of which will be on exhibition at the World's Fair. The piece, six feet in length and four feet in width, now ready, includes the State of Connecticut and a bit of Long Island and eastern New York. This vast map will take at least twenty-five more years to complete. Its detail is such that upon it will be indicated every stream, brook, hillock, mountain, valley, farm, village and city. It will show every public and private road as completely as a surveyor's map of a small township. This map when completed, would, if spread out, cover a little over three-quarters of an acre in superficial area. Of course it would be impossihle to suspend such a map as to make it available for practical use, and therefore it will have to be published in sections. In addition to this piece of the map of the United States the geological survey is preparing an outline map of the country, which will also be exhihited at the Fair. It is to be spherical in shape. By it at a glance tbe different elevations, the tablelands, the mouutain ridges and the valleys will be indicated in tbe outline, the highest peaks of the mountains being proportionately elevated as mucb above the sea level as are the peaks of the Rocky mountains above tbe Atlantic and Pacific coast lines.

THE illustration of the great engineering work of the world will he one of the most interesting features of the Transportation exhibit at the World's Fair. Following the announcement that the large and very perfect model of the Forth bridge has been secured comes the application of the management of the Gothard Railway company, of Switzerland, for space in which to show a large model or relief map of that road. This will illustrate in the most graphic manner possible the famous St. Gothard tunnel and the manner in whicb mountain inclines are surmounted by modern engineering sclence.

THE Nevada Silver League is to hold a convention at Winnemucca on Sept. 15tb.

Coast Industrial Notes.

IT is estimated that the deciduous fruit of Southern California for this year will reacb 10,000 carloads, valued at $3,000,000, and that the citrus fruit will reach 6000 carloads, valued at $3,500,000.

THE San Felipe Havana Tobacco Co. has been organized at Gilroy, Santa Clara county, to manufacture the product of Culp's San Felipe plantation; capital, $100,000. P. C. Hodges is president, and George T. Dunlap secretary. Work will commence at once.

WORK bas been started upon a great water storage and irrigating enterprise in Sabino canyon, near Tucson, where reservoirs will be built. There will be three dams, the estimated cost of which will he $80,000. The capacity of these reservoirs, which are in a line one above the other, will he 6,000,000 gallons.

AMONG the most important of the newly inaugurated industries of Humboldt County is the fish hatcheries at Gaston and Redwood. Though still in their infancy the success of the enterprise is assured, and the temperature and surroundings have proven all that is required for the complete propagation of fish.

J. E. SHAFFER, of the La Punta Salt Works, San Diego County, has shipped twenty tons of stock salt to an ice company at Riverside and fifty tons to San Diego, during the last month. Orders have been received for thirty tons of salt to be used in fish-packing at San Diego. The salt is shipped from La Punta to San Diego by sloop.

THE Metropolitan Electric Railroad Company, which has a new line to Golden Gate Park, wants a subsidy of $125,000 for the continuation of its road to the beach, and the Soutb Side Improvement Club is planning to raise the money. The proposed extension would bring the road close to the Ocean House, and six miles of double track would be necessary.

IT is rumored in Wall street that efforts are being made to form another copper copper combination. One scheme is to establish a selling agency for all American copper, and the other to gather in the producers of copper. Efforts were made several months ago to get the producers into an agreement by which tbe trade could he controlled, but they failed to be successful.

WORK is soon to be commenced in tbe paint mine at Valley Springs, Calaveras County. The property is now in possession of a new company, and they intend to put up a large engine and all the necessary machinery at Valley Springs for grinding and mixing, in fact do all the work there that is needed to make the paint ready for use. If the plant is built it will give employment to about fifty men.

THE Rodeo Cold Storage Company has secured a ten-years' lease with the option to purchase, of the four fifty-varas east side Sixth, south side King and north side Berry, from Mrs. Annie Donahue. The South San Francisco Cold Storage Company bas purchased for $125,000 the two fifty-varas northwest corner sixth and Townsend, and leased the property on the northeast corner from Thomas Magee for ten years for $99,000.

THE fall run of salmon on the Sacramento river is the largest known in years. For the first time in three years the canneries have been opened to do business on the full run. The Benicia, Black Diamond and Cbip's Island canneries are running to their full capacity, and will continue to do so for three weeks yet, though the salmon season closed on September 1st. The salmon are now spawning, mostly in the headwaters of the McCloud river.

THE surveyors on the Feather river through Plumas county, are rapidly completing their work. They began on the railroad survey at the Delaney canyon, and last week had finished down through that canyon, through Mohawk valley, Long valley, over the Lee summit, past Spring Garden and along tbe north side of American valley. By this time they must bave nearly if not quite completed the line to Soda Bay where the second party began work.

The Portland Cable Railway, together with all its properties, buildings, franchises, etc., was sold August 30th by the Sheriff to J. P. Marsball, cashier of the Ainsworth National Bank, for $250,000. Six months ago the directors of the road borrowed $200 000 from Marshall, but were unable to pay when the note became due, and the mortgage which was given as security was taken to judgment. The bonded indebtedness of the road is $400,000, and the entire plant and property is valued at $800,000.

THE *Astorian* announces that the Northern Pacific Railroad Company bas acquired by purchase the surveys made for the railroad commonly known as the Gohle road. These surveys are for an extension of the Northern Pacific from Goble to Astoria. An option was recently given on them by the parties interested here. The purpose of the Northern Pacific in acquiring these records is undoubtedly to extend its track from Gohle to Astoria, a distance of about fifty-seven miles.

THE Morning Star Mining Company of Iowa Hill has bought of Coleman Bros., of Grass Valley, the water ditch or canal situated in Placer County, known as the "Iowa Hill Canal," and all the right of way held and used in connection therewith. Said canal bas not been completed according to the original design, hut bas been constructed over a great portion of tbe intended line. It is the intention to convey the completed portion as well as all the right to the grantors to the uncompleted portion.

ONE hundred and thirty-five prisoners were released at Wallace, Idaho. Indictments were found against every one of the miners by the United States Grand Jury now in session at Cœur d'Alene City. It is, however, deemed best not to bring them to trial at present, hut to keep the indictments hanging over them as an incentive to good behavior, Most of the troops will now leave the Cœur d'Alene country. The backbone of the union is supposed to be broken, though the released miners are confident tbey will yet succeed in driving out the nonunion men.

AT Rodeo, the site of the great meat-packing industry, on the San Pablo hay shore beyond Point Pinole, the various buildings are being pushed to completion. Five boilers and an engine are in position, and the machinery for the various departments is being put up by skilled machinists. There are hundreds of men and teams at work on the company's reservoir, which, when completed, will have a capacity of over 1,100,000 gallons. A great deal of money is being spent at the new town.

THE private circular of I. Steuart gives the receipts of coal at this port in August at 82,000 tons, against 87,200 in August, 1891, and 95,020 in August, 1890. The receipts during the first eight months of the year were 794,500 tons, against 856,020 tons during the same period in 1891, and 666,160 in 1890. The circular says: "The coal market during the month has been quiet, without much change in spot prices, although the scarcity of some brands of foreign coal induced holders to ask higher rates. Quotations for future loading of foreign coal show a small advance, but transactions are very limited, as buyers are timid."

THE linemen of the Pacific Bell Telephone Co. of this city have struck because they were not paid on the 4th inst. as per agreement, instead of on the 6th; and they claim also that in all working corporations there is a rule to the effect that employes injured in the company's service shall receive due attention to their injuries, including the benefit of medical attendance and wages as usual; that this company has always refused to follow the general example, and has referred the men to the Employer's Liability Insurance Company, which company has refused to recognize such claims, as instanced in the case of one of their men some little time ago; and that both companies have expressed their intention of fighting to the bitter end any such claim made upon them.

B. M. SMITH, Superintendent of the Visalia Gaslight and Heat Co. has commenced increasing the capacity of the plant. Two tubular boilers of fifty horse-power each have been purchased, and with the boilers now in use will give a battery of four boilers, with a combined 200 horse-power. The engine will he one of the best improved and latest patterned machines now made, and it will he heavy enough if the plant is ever increased. A Thomson-Houston dynamo of 350-light capacity and a Thomson-Houston arc dynamo of 30-light capacity have been ordered. With the dynamo now in use the new plant will have an incandescent light capacity of 1100 lights. The old gas and electric light house is to be remodeled and put in good condition for the new plant. If nothing happens, Visalia will be lighted by electricity about November 15th.

THE Fish Commissioners have made some important distrihutions of young fish throughout the State during the past two or three months. Over 3 000,000 young salmon have been hatched and distributed from the principal State hatchery at Sisson, near Mount Shasta, into the head waters of the Sacramento, Pit and McCloud rivers. This has been done for about one-half of the expense heretofore incurred by the commission in like work. The reduction in expenses has been accomplished by abolishing the office of State Superintendent, and tbe commissioners have taken the duties of that officer on themselves. The hatchery established at Bear Valley, Marin County, has proved a great success. Between 700,000 and 1,000,000 New Hampshire trout have heen hatched at that point, and distributed into the principal streams of Marin, Sonoma, San Mateo, Santa Cruz, Monterey and San Benito counties.

THE schedule of wages for workmen at the Mare Island Navy Yard, as prepared hy the board recently appointed to fix the rates for the present quarter, also with the new ratings, has heen approved and is now in working effect. Persons desiring employment at the navy-yard will be employed under the classes named in the schedule. Should another rate than those designated be required, permission will first have to be obtained from the department after it bas been officially informed of the needs and requirements of the extra rating. This is in accordance with a recent law, under which the classes are scheduled "A" and "B." Class A takes in helpers of all kinds and those without a specified trade, while class B is composed mostly of mechanics, etc. The pay is divided into four rates. An employe is taken on in a department and is allowed say three days to show his ability for the work he has been put at, and then classed accordingly.

THE new works of the Bell Electric Company, a mile and a half northeast of Auburn, Placer County, are ready to start. The water-wheel which runs these works is an interesting feature. The wheel is six feet in height with 15-inch buckets. Two undershot nozzles, one three and a half and the other four inches, furnisb the water, bringing to hear a pressure of about 550 inches. The water has a fall of 72 feet down a steep incline. The combined power of the two dynamos, which run side hy side, is 900 lights of 16 candle power. The company is running almost a full capacity of lights; the forty street lamps just added bringing the total to hetween 800 and 900 incandescents. Mr. Van Frank, of the General Electric Company of San Francisco is in attendance at the works superintending the new machine, which so far has given the company satisfaction. Ed D. Brown, general superintendent of the Bell Company's works, has great faith in some day extending long-distance lines to towns ahove and helow Auburn.

THE franchise for the first electric road in Alameda, has been granted to W. M. Rank. Work on the new road is to commence within six months and it is to he completed within two years. The present horsecar line that runs tbrough Santa Clara avenue and Webster street roadway to Oakland is already heing transformed into an electric road, and the tracks are being laid through Park street that will connect with Oakland over the tidal canal hridge to Fruitvale. The franchise for the new road gives the company the privilege of operating their lines through the following streets: Along, upon and over St. Charles street, Santa Clara avenue, Kings avenue, Morton street, San Jose avenue and Park street, in the city of Alameda, State of California; also along, over and upon Park street, Santa

Clara avenue, Versailles avenue, Central avenue and High street. The provisions added are that the company shall pay two per cent of the gross receipts yearly into the city treasury, and be also subject to a tax not exceeding $50 per year upon the cars in use in the system. The road will also be changed to Santa Clara avenue from Central avenue in the event of the former avenue being opened between Versailles avenue and High street. The new company is the same that recently purchased the streetcar line from Mr. Meetz. It has been reincorporated as the Oakland and Piedmont Electric Railway Company.

THE Northeastern California R. R. Co. recently incorporated intends to build and operate a standard gauge railroad to run from Castle Crag, on the line of the California and Oregon Railroad in Shasta county, and running thence in a northeasterly direction in and through Shasta county to a point at or near the southwest corner of section 28, township 40 north, range 1 east, Mount Diablo base and meridian, in the county of Siskiyou. The estimated length of the road is thirty miles. The Company also proposes to construct and operate a telegraph and telephone line along the railroad. The Directors are E. A. Lancaster of Chicago, D. E Miles and L. D. Brewster of Wisconsin, Henry L. Tatum and J. J. Bowen of the well known firm of Tatum & Bowen of San Francisco, and S. P. Smiley and A. M. Willis of the sime place. The capital stock is $150,000, which has been subscribed. The Directors are members of the Red Cross Company which owns extensive timber interests in northeastern Shasta and southeastern Siskiyou and the route will be the one from Lower Soda Springs or Castle Crag which has already been started for Bartle on the McCloud, the center of the Company's vast lumber interests, where they have built a big sawmill.

Personals.

HENRY T. BUSH has been elected a trustee of the Mechanic's Institute in this city.

HOWARD T. HOLMES has been appointed chief engineer of the State Board of Harbor Commissioners, vice Marsden Manson resigned.

MELVILLE ATTWOOD, the well-known mining engineer and geologist, has been examining some mining properties near Sawyer's Bar, Siskiyou County.

TUSTIN CHENOWETH, of Benecia, who has contributed several interesting articles on popular geology to the MINING AND SCIENTIFIC PRESS and other papers, is visiting the city.

JOHN B. HOBSON, the expert hydraulic miner, who has been for several years in the employ of the State Mining Bureau, is at present engaged in some mining operations in British Columbia.

S. B. CHRISTY, Professor of Mining and Metallurgy at the University of California, has been spending a few weeks among the mines of Grass Valley, with some of the students of his department.

RUSSELL L. DUNN, the Deputy United States Mineral Surveyor of Auburn, Placer County, who has been for some months engaged in field work in Siskiyou and Shasto counties for the State Mining Bureau, has returned to the city.

MARSDEN MANSON, for many years chief engineer of the State Harbor Commissioners, has resigned from his position and has received an appointment as engineer under the commissioners who are to provide a new sewer system for this city.

THE resignation of Mr. George Ohleyer manager of the Anti-Debris Association, which was filed last December, was accepted at the meeting of the Association last week. A new organizrtion is to take hold of the work of fighting the hydraullc miners.

WM. S. DANEY, of Deadwood, S. D., is the last man claiming to have discovered the famous "Lost Cabin" mine. This time it is in the western part of the Black Hills, many miles from a settlement. The discoverer claims to have found a room hewn out of the rock, and in it was a human skeleton and $25,000 in gold nuggets.

W. M. RANK & CO. have applied to the Alameda County supervisors for a franchise for an electric road on High street, commencing at the northerly boundary line of the city of Alameda, thence along High street to the old county road, or Prescott street, thence to Twenty-seventh avenue, to Julia street, to East Sixteenth street, to Howard street, to Park street, and thence to the charter line of the city of Alameda.

A NUMBER of firms doing business on the water-front have united in asking the Harbor Commissioners to grant the Ferries and Cliff House Railway Co. the privilege of running horsecars over the board's belt road as far as the same may be extended between the present terminus of the railway company at Powell and Bay streets, along Bay and East streets to Market street, during such hours of the day as will not conflict with the regular business of the freight traffic of the board's road.

MANAGER FLINT of the Electric Street Railway, owned by the Spreckels Bros. in San Diego, has applied for a franchise in that city to build and operate an electric line across D street at Arctic street. This crossing will give the San Diego, Oldtown and Pacific Beach motor line connection with the street-car line, and it can be operated from the same powerhouse, less than a block from the connection. The line can be transformed to an electric line very quickly, for as such it was built.

PILSBURY HODGKINS, better kuown as "Chips" the vetern Wells, Fargo & Co's. Express messenger, died in this city this week. He came to California in 1849, and in 1851, he carried letters and packages through the mining camps from San Francisco, Sacramento, Stockton and Marysville, to do which he traveled on a white mule. From 1857 to 1870 he was the company's messenger to Stockton and until 1877 to San Diego. Down to 1886 he had charge of the steamer department, and until December 1891, was in the collection department.

The Pine Creek Mines, Oregon.

CORNUCOPIA, Union Co., Oregon, Aug. 29, 1892.

TO THE EDITOR:—In 1885 I left San Francisco to examine the mines in granite mining district, and known as the Pine creek mines in Union county, Oregon, and have remained in the district since that date. The district is 60 miles northeast of Baker city and the same distance east of Union—the county seat.

The district is composed of stratified or secondary granite and slate, and the outcrop of the best veins is from 18 inches to seven feet in width. The ore contains about four or five parts in value in gold to one part in silver, and the average grade of the best mines—that is, of all the ore in the vein—is probably about $15 a ton. But many of the mines contain very rich ore, and have shipped to Denver and Tacoma; in every instance with profit. There are at least nine parallel veins passing through the district, and are traced and located for a distance of 5000 to 12,000 feet each. There is about one-half of the value of the ore contained in the sulphurets, the other half is saved on the plates.

Pine creek runs through the center of the district and contains 20,000 inches of water during the spring and early summer months; through the winter this quantity is reduced to 1,200 or 1,500 inches. In this, I do not purpose writing a report of the district; I simply give a few points so that the mining men of California may have the outlines of a picture of what exists here. Californians are not in the habit of buying mines on representations made by strangers; such buying is done on the reports of mining men in whom they have confidence. Therefore, our object is to have them send such men to our district and make a thorough examination of what there is here, and should such men come, I caution them to pay no attention to anything that may be said against this district, while on their way. The miners—in most instances, God save the mark—of eastern Oregon, have not yet accepted the proposition that a prosperous mining camp in any section of eastern Oregon, would not have sufficient mines of merit to accomodate all who would want to purchase, and the overflow would give an impetus to every mining district in this section of the State.

Should any parties come here, I will take pleasure in showing them the camp. I have mined 19 years in California, nine years in Nevada, three in Arizona, two in Leadville and seven in this camp, and with the exception of Dakota and Montana, have examined and reported on mines for capital in all of the Pacific States, including Colorado, New Mexico and old Mexico. In 1882 I examined the Paris or Treadwell mine in Alaska, in the interest of Senator Jones, and on my report he bought the interest. I was told that all who had made examinations preceding mine, had reported adversely. On my return from the mine the Senator had gone to Washington, and it required ten days for me to bring S. L. Jones up to the buying point. My experience in mining is mentioned to show that I am not likely to remain seven years in a mining camp that has no future. ROBERT KELLY.

Gold Mining on the Fraser.

Reports from the neighborhood of Lytton seem to indicate that something like the revival of the historic period known as the "Fraser river excitement" may be anticipated before long. At a point about three miles north of Lytton, is likely to be the first scene of hydraulic gold mining on a considerable scale. At the placementioned, is situated the Van Winkle bar, where 300 miners, between 1860 to 1863, took out immense amounts of gold. From time to time the ground has been worked over by Chinamen, who are reported to have made on an average $2 a day with their crude methods anda scanty supply of water.

For more than a year past Messrs. de Wolf & Munroe of Vancouver, havehad men out prospecting for the most eligible sites for hydraulic operations. Among several locations which they finally selected as apparently likely to yield good results, was the old Van Winkle bar, about three miles north of Lytton, on the Fraser river. The banks rise in a series of steps or benches, the distance between the levels being on an average about 150 feet. The facilities for bringing water for the hydraulic appliances from various creeks are excellent, while the situation is not unfavorable for the disposal of the tailings or dump. In order to get as much information as possible before actually incurring large expenditure, the syndicate, which Messrs. de Wolf & Munro have interested in the matter, had four shafts sunk and two cuts made to test the gravel and ascertain that the gold-bearing deposit was of considerable area. It is said that the results ascertained by means of this experimental work were very satisfactory, and that a Mr. Hobson, a well-known mining expert from California, who examined the property about two months ago, spoke in the highest terms of it. Two weeks ago he made a second inspection and suggested that a deep cut should be made on the second bench. This was done under his directions, and, as was anticipated would be the case, the old channel of the Fraser river was discovered.

From other reports that have come down from Lytton it is believed that the gravel will prove as rich as any found in Cariboo. Water is on the ground from Last Chance creek, the syndicate having acquired the old ditch and water rights and widened it, so that they will have between 1000 and 2000 inches of water with a head of 400 feet. The ditch is about a mile and a half long, and from the pen-stock there will be 3000 feet of 17-inch pipe, for the present fitted with a No. 6 "Giant" with a 7-inch outlet. This will be sufficlent to put through from 5000 to 8000 yards a day, according to the condition and quality of the gravel. It is expected that work will be actually commenced in October.

The syndicate owns about 660 acres, extending for about two miles along the river. The second bench is about 160 feet above high water mark and the third bench about the same elevation above the second. It is believed by some persons that the mother deposit of the gold which has been taken out in the past will be found in the third bench. Should that theory prove correct, the syndicate has a bonanza.—Kamloops (B. C.) Sentinel.

Dry-Goldwashers.

The Salt Lake *Tribune* witnessed the testing of a placer-gold machine the sales of which are now controlled by a Salt Lake corporation. The *Tribune* says: The machine is the invention of C. F. Willsie, and is constructed with the object of separating flour and other fine gold from sand or concentrates in a dry state, no water being used in its operation. It is composed of two parts, the vibrator and screens, and the quicksilver flume through which the fine sand is driven with great :orce by means of a current of air from a No. 4 blower. In the flume are four pans, the bottoms of which are covered with quicksilver to the depth of half an inch. When the machine is in motion, light agitators revolve in the flume at a good rate of speed, keeping the quicksilver in motion on the surface, thus keeping the surface constantly bright. When the sand is shot through the flume, adjustable gates regulate the flow so that the current of sand may be regulated, according to the capacity of the silver, to catch the gold particles in the sand. The flume is about four feet long, eight inches deep, and 14 inches wide, and the capacity of the machine is 100 tons of dirt per day. In the test made, sand with a known quantity of gold dust in it was passed through the machinery and when the amalgam was retorted, a button was obtained which showed that none of the gold had been lost. Tests have been made of several tons of Snake river sand, and when it was passed through the machine, not a trace of gold could be discovered, the gold all being in the silver pans in the flume. The machine seems to do the work thoroughly, and if it is what it seems to have proved itself, the gold product from placer-sand will be largely increased. It is probably the only dry-operating machine which is a complete success, and a dry-machine is what has been wanted for years. Mr. Willsie has spent many months perfecting his machine, and is highly gratified at his success. The machine is very simple in construction, and can be run to its full capacity by a two-horsepower.

A correspondent of the Santa Ana *Blade*, in describing the Silverado mines in Orange county, has the following to say about a dry-washing machine or concentrator on the Bluelight mine:

The Bluelight mine is owned by Dunlap, Hopkins & McGuire. We were fortunate in finding Mr. Dunlap at the mill, and he said:

"I located this mine over 12 years ago, and have been working it off and on during that time. I have always known that it would pay well to work the Bluelight, but have been hampered by the barrier of no money to push my operations. Now we are on the highroad to success, and I have no doubt but that in a short time talk of the wealth of the Silverado mining district will be heard all over California.

"The mill we have now put in is not the one we intend to use, for we are having a large one built. When it is ready we will be able to handle ten tons of ore per day."

We were then introduced to J. B. Freeman of Los Angeles, the inventor of Freeman's dry-concentrator, and a most agreeable gentleman. He showed us the entire workings of the mill.

The ore is brought from the mines in sacks and piled up back of the mill. On the second story of the mill is the orecrusher, and into the first pulverizer the ore is fed, this breaker taking rocks as large as an orange and crushing them until they are about the size of a walnut. Lower down is the second crusher, and into this passes the crushed rock from the first pulverizer. This crusher grinds the rock into bits the size of a pea, and these pieces drop down between two iron rollers and are rolled into powder. The powder is run into a sieve and then into the dry-concentrator and on to an endless belt. This revolves, and a bellows run by steampower, and having regular pulsations, causes the gangue or waste matter to go to the surface of the belt, which is of fine wire, and the metal to sink, and by the revolution of the belt the gangue is separated from the metal, leaving it nearly free. The capacity of the rock pulverizer is ten tons per day, while the concentrator has a capacity of five tons per day of 24 hours.

The ore concentrates well, the concentrates being galena and iron, and about 15 tons of the ore is reduced to one of concentrates. These concentrates are used in large smelters in working dry ores, and are much sought after for that purpose. They will bring their assay value, no charge being made for separating the precious metal.

There is no doubt but that the work done by the dry-concentrator is of a high order, and Mr. Freeman's invention will revolutionize mining in this country. The one great obstacle in the way of successfully opening mines has been lack of water, but Mr. Freeman's dry-concentrator does away with this and removes the only barrier in the way of successfully mining in a country where water is scarce and minerals are found.

This is the first mill of the kind yet operated, and Mr. Freeman and the owners of the mine are highly pleased with the work it does.

The distance to Bluelight mines over the road now traversed is nearly 26 miles from Santa Ana, while by an air line we are only 11 miles from the mill. If the work proves as profitable as it is expected, a wagonroad will be built over the mountains to Tustin, a distance of only 14 miles, and over an easy grade, which will be of great saving in the cost of transportation to and from the mine.

The Mines of Plumas County.

By our Traveling Correspondent.

SIERRA VALLEY, Sept. 1, 1892.

TO THE EDITOR:—To many of the people of the State, Plumas is a wild, forbidding county, inviting only to the hunter or the fisherman. Little is generally known of it beyond its geographical location on the map, and to those who have thought of going thither no railroad seems to approach within many miles. This latter is about the one fact the unkoowing outsider does know.

It is to the present insufficient means of communication and transportation that this general misunderstanding is due, and offers the reason for the tardy progress of the county compared with other portions of the State. Plumas is doubtless the richest in varied natural resources of any of the mountain counties of California, and few counties have their resources less developed. Its mineral and timber resources are generally known though they have by no means received the recognition they deserve, and it cannot be expected that they will until the county is put in better commercial contact with outside markets.

It is the same with the agricultural products. Scattered through the mountains are many of the most fertile and beautiful valleys that can be found anywhere in the State and perhaps in the world. Such are Big Meadows, Indian valley, American valley, Mohawk valley, Sierra valley, each comprising an area of from 20 to 100 square miles.

Farms vary in size from 50 to 1000 acres, and one considering Plumas mountain farms must first overcome the impression that they are all of the "perpendicular" type.

Plumas is not a citrus region, with from five to seven months of winter, but what may be raised can be produced in abundance. It has remained largely and necessarily self dependent, to produce much that it needs and to consume what it produces. Heretofore, the only market for these products has been the mines, and with that industry prosperous the rest of the county thrived. But on this mining question I may have more to say another time under a heading, were I to label it, "A Plea for the Small Hydraulicker."

Two things the people of Plumas look forward to, prayerfully and hopefully—the resumption of hydraulicking and a railroad. Which they wish most is scarcely distinguishable, though the actual coming of either is, perhaps, equally remote. But the surveys now being made through the county have brought about a confidence amounting to conviction that the road has really come. It is certainly a question of immense importance to the county, for with railroad communications an immense region would be opened up for settlement and development, and naturally the mines and mine-holders would be the most benefited.

We could then look confidently to Plumas as the great mining region of the State. Much of the country has not yet been explored and none of it prospected thoroughly. Many with small means are holding good properties until improved and cheaper facilities of transportation will permit them to proceed with their developments, or bring in others with more means than they possess. Numerous places known to be rich in mineral, and which under ordinary circumstances in a more ordinary country would long ago have been worked, lie waiting a first locator.

During the past year or so the mining industry in Plumas cannot be said to have advanced greatly, if any, though there is the continual prospect and hope that something shortly will happen.

With the closing down of the hydraulic mines there was nothing left, with one or two minor exceptions, but the quartz interests.

THE PLUMAS EUREKA.—Principal among the mines of this character is the famous Plumas Eureka, situated half a mile, on the vertical, from Johnsville, in the southern part of the county. For 40 years this mine has been working steadily and has paid to its English stockholders nearly four millions in dividends. Owned by the same company interested in the Sierra Buttes mine, the same policy was adopted in both of not being in a hurry to work all the good rock at once. They struck a fair dividend-paying average and stuck to it. When the ore ran to high grade it was "diluted" with low-grade rock, and conversely, with the striking of a big body of poor-paying ore its average would be raised by an infusion of better-quality material. When pay rock was scarce, fewer stamps were necessary, and thus the mine has run on steadily for so long that it has come to be considered inexhaustible. In times past the mine has yielded as high as $70,000 a month, and at present averages $15,000. For a year past 15 of the 60 stamps have been hung up. The average of the ore worked at present is $4.85 per ton.

The mine is considered, even by those interested, about worked out, as continual prospecting during the past two years and honey-combing an immense amount of ground fail to discover new chutes such as the mine possessed formerly, As in the Sierra Buttes, there is a limitless amount of quartz, but little bearing gold.

The quartz ledges of this mine are highly interesting and quite as inexplicable. There is a total absence of regularity, one with each other, and even in the same ledge. One ledge will assume a vertical, a dipping and a horizontal position by turns, and seemingly parallel ledges will dip toward or from each other. For sometime past work has been confined to the old "'76" tunnel in the upper works and the old Mammoth tunnel of the early Eureka claim. The mine continues to pay, as the moment it ceases to it will be shut down. Since visiting the mine I understand a rich chute of ore has been struck near the old "'76," which may mean a new lease of life.

THE JAMISON.—It is on this mine that the future of Johnsville and that entire mining region may be said to depend. It is situated a short distance from town and the Eureka, on Little Jamison creek. This mine is owned in Philadelphia. S. W. Cheyney, a capable young man and mining engineer, is superintendent. While this mine has all the prospects of being a big one, if it but gets a show, Mr. Cheyney candidly admitted that at present he was not encouraged to speak praisingly. Ninety thousand dollars have already been expended in developments. These consist principally of a drain tunnel, 1700 feet long, running from the junction of Jamison and Little Jamison creeks to the ledge, and a shaft raised at that point to the surface, about 200 feet. The ledge where it has been opened up averages four feet; the ore is low grade.

The erection of a mill depends entirely on what may be found later. Several fine, substantial buildings are on the property, and only the discovery of plenty of good ore is necessary to make it a worthy successor to the Eureka.

Eight miles west of Mohawk, on the Quincy road, is the Consignee gravel mine, owned in Pittsburg, Pa. A tunnel 2100 feet in length has been run to tap a blue-gravel channel. Mr. P. E. Traynor, the superintendent, says they are sufficiently encouraged to go ahead, and in time hope to have a mine.

Mining about Quincy, Spanish Ranch and Meadow is very quiet indeed. A few placer claims have been worked some the past season, but have closed or want of water.

THE SHENANDOAH.—Twelve miles from Quincy, at Rich Bar, on the East Branch of the North Fork of the Feather river, the Shenandoah Quartz Mining Co., an Oakland corporation, is operating a ten-stamp mill. Mr. Samuel K. King is superintendent. I. B. Whiting, one of the directors, stated that at present they were engaged in making a ditch from Clear and Mill creeks to the mine. The mill is a mile and a half distant, so far that work in the winter is now impossible. They intend moving it, consequently, to the immediate vicinity of the mine. Mr. Whiting reported the prospects flattering. The trouble, however, with the paying quartz of this section is that it has generally been found to lie in "pocket ledges." The Shenandoah may be an exception.

THE GOLDEN GATE, situated eight miles west of Quincy, is at present being operated by Jacob Stephan and Charles McLaughlin under a three years' lease. The mine is the property of J. B. Sutton and four associates, who erected a five-stamp mill a year ago. This spring, however, this mill was taken down and a new mill of ten stamps erected. The ledge is what is known as a "blanket" or horizontal ledge, and is worked from the surface. It averages three feet in thickness. The rock worked last fall is claimed to have run $9 a ton.

THE FALL RIVER CONSOLIDATED.—This quartz mine is situated in western Plumas, 14 miles from Forbestown, on Fall river. Owing to its isolation, I did not visit it, but Mr. J. C. Wolters of Gibsonville, the president of the company, furnished the following statement. From this and what else I could learn, it is doubtless one of the promising mines of the county. The company controls four claims, two of which have been patented. The work of development has gone on steadily for the past four years. The ledge is opened up by two crosscut tunnels, the first and upper of 115 feet and the lower and working tunnel 790 feet. This latter is through bedrock and was driven by hand at an average cost of $25 a foot. A 4½ foot vein is here shown with 325 feet of backs.

Mr. Wolters showed some handsome specimens which he claimed were not above the average run of the rock. He had just received returns from Thomas Price's assay office, on similar rock, which, should it prove a continuous milling ledge, ought to satisfy most any of us. According to this, it was $63 00 in free gold and $5 30 per ton in sulphurets. A bonanza, surely—if there's only enough in it. A 10-stamp mill is being erected, five stamps of which are now in position and working to good advantage and profit. Mr. Hector Forbes is superintendent.

THE DIADEM MINE of J. A. Edman, four miles south of Meadow Valley, has undoubtedly been the richest quartz bonanza in Plumas. Though idle at present, it can by no means be said to be worked out yet, and is not believed so to be either by its owners. The sums that came out of this mine, in places the size of a candle-box, seem incredible. Not infrequently an afternoon's prospect yielded from one to five thousand dollars. The mine has been developed by about 3000 feet of tunnels, and by a shaft 300 feet in depth. A great portion of this shaft, Mr. Edman's states, averaged $1,000 a foot. The lode is from 50 to 120 feet in width, with an average of 60 feet. It courses northwest and southeast, with a dip of 60° from the horizontal. Its character is decomposed rock, carrying quartz, talc slate, oxides of iron and manganese, dolorite, etc. The average width of the milling rock is 20 feet, the pay chute generally following the footwall. In this mine the footwall has been found to be very rich in coarse gold to a distance, sometimes, of five or six feet from the ledge. The sulphurets in the quartz are generally decomposed and form about three per cent of the ore, though the gold as a rule is free, but in very minute particles. An important discovery has been made on the 300 foot level of a rich though unfortunately limited deposit of gold tellurides, running from $20 to $500 per ton. This is the only mine, to my knowledge, in this section of the State, that has been found to possess this valuable compound.

For three or four years the company has endeavored to work the ore through two Huntington mills—one of five feet, the other three and a half. This has been entirely experimental. After extensive researches, mainly by the aid of the microscope and by practical milling tests under different methods, and on ores in quantities of fifty tons and upwards, Mr. Edman has determined on a total change of the milling system, and will erect a new plant this fall and next summer, by which he hopes and expects to obtain a larger percentage of gold.

Mr. Edman is a scientific man, a geologist and microscopist, of more than local reputation. Besides writing much, he prepared some years ago a map showing the geological formations of western Plumas, that represents great care and study, and is of particular importance to miners as well as students, giving a splendid basis for further work in the same field. It was published by the State Geological Society.

About two years since, Mr Edman suffered a severe loss in the destruction of his house by fire, and by which he lost one of the finest and most valuable cabinet collections in the State.

AT CRESCENT MILLS both the Green Mountain and the Crescent are quiet, as far as milling is concerned. At the latter, Mr. W. H. Whitney, the superintendent, candidly confessed they had nothing at present to talk about, but they are at present sinking 200 feet deeper and crosscutting, with hopes of striking a paying lead. The company met with a serious loss this past spring in the burning of their hoisting works. However, new and more efficient works have been built, new pumps put in, and everything is now in first-class condition and only waiting for the strike.

Mr. G. P. Cornell, superintendent and owner of the Green Mountain, is working a large force of men underground. The tunnel they are in now is 1 mile and 800 feet in length and it is expected that another 800 feet will tap the ledge 5100 feet in. An upraise of 600 feet has been made to give ventilation. Mr. Cornell expected to have his 60 stamps running again by the first of the month, as he claimed he had plenty of ore in sight. This mine, unfortunately, has been so entangled with stocks and "johs" in the past few years, and with unpleasant rumors of the amounts due men, that it has received a "black eye" in the public estimation. It is to Mr. Cornell, if to any one, that we look for a remedy, or a refutation.

At Genesee, a few miles east of Taylorville, Jos. Gruss has a small mill on a fair-paying ledge. This locality, however, I was not able to visit. Near here, I understand, there are several good prospect claims.

With too many prospectors there is this fault: If they discover a good thing they lack means to carry it forward, and believing they have a bonanza, demand such figures that they turn away rather than attract capital. Mine-buyers nowadays want no fancy tales; they want a developed mine if they have to pay for one, and too many of these high figured holes in the ground, while they may have millions in them, are not really worth the demanded price. For instance, in this locality is a rich copper ledge, carrying also considerable gold. The owners are anxious to sell and there have been a number of parties anxious to buy. As a rule, those who are desirous of securing a property will pay all it is really worth in the condition it may be, and whatever they should offer, it would be more money in all likelihood than the prospector would otherwise ever get. Even though he should not get as much as he thought was righteously his, it would amply repay his labors and enable him to start out to discover new fields. It is too often analogous to Æsops' "dog in the manger."

At Gillville I met one who was among the first to realize on the Bodie excitement of some years ago. One day there came to him in that town of "bad men" a sheep-herder with some peculiar-looking ore specimens. No one that the man had shown the ore to knew what it was, but at a glance my friend knew it to be a rich carbonate. Accordingly they located it, and each went again about his business, one of herding sheep the other as a millwright. Shortly after, two young Englishmen came into that section in search of mining properties and were attracted by these same specimens. They asked how much was wanted for the claim, and were surprised on being told that they could go look at it, prospect it if they wished, and when satisfied pay what they thought was right. Two weeks later the locators received a check for $10,000, and the mine developed into one of the bonanzas. Both the carpenter and the sheepman were previously poor men. The herder immediately put his money into sheep, and is now rich. The other built a five-stamp mill on another claim he possessed, and the mill burned a week after it was completed. But that is another story. Prospectors may choose their own moral.

The 40-stamp mill of the Indian Valley mine has been idle for the past two years. This is the property of S. P. Prentiss of S. F. The mill is said to be the finest equipped in the State.

THE STANDART & MCGILL, 3 miles west of Greenville, is running its 20 stamps steadily. At present the ore is hauled half a mile to the mill. The mine includes 3500 feet of patented ground developed by two tunnels 850 feet and 1400 feet in length. Work at present is being carried on in the latter. Mr. Geo. Standart, superintendent, had little to say, as the mine is "not for sale."

JOHN BULL.—Toward town and adjoining the Standart is the John Bull. This is the property of its three original locators, Messrs. Firmstone, Richards and Cozzallo. They are running five stamps and taking their ore from an average 10-foot vein, reached by a 400-foot tunnel. The ore averages $6. Since visiting the mine I understand the mill has shut down temporarily.

ALTONA.—Mr. F. F. Emmons is using the 10-stamp mill of the Round Valley Consolidated to crush the ore of his Altona mine. As this necessitates hauling the ore a distance of nearly two miles, he intends soon to erect a mill on his own property, to be run by steam. The size of the mill will depend on the output of the mine. The mine at present is developed by a 400-foot tunnel, disclosing a 9-foot ledge which averages $7 a ton.

BLIND LEAD.—D. McIntyre has about completed his 10-stamp steam mill at Wolf Creek, nine miles northwest of Greenville. His mine is known as the Blind Lead, and is in the once famous Gold Stripe district. The two Gold Stripe mills of Geo. Standart, one of 15 the other of 24 stamps, are still standing idle, the ledge having been worked out.

There is a promise of something interesting with the opening of the McIntyre mine, as his ledge is said to be nothing but a "slip" covering an already located gravel claim. Whether the ledge be a true one or not, it is to be regretted that there is the prospect of litigation even before the work has begun.

THE SAVERCOOL MINE, ten miles south of Prattville, on the North Fork of the Feather river, is running its 40 stamps steadily, and is said to be paying well. Alex. Cameron is superintendent.

The famous Dutch Hill hydraulic mines are now quiet necessarily, though Gen. Chipman has recently secured a bond on them by which they are to be operated by drifting.

CHAS. E. TOWNSEND.

Scientific Progress.

The Acids of Fruits.

We know that many vegetable and fruit products are esteemed rather for their pleasant or refreshing taste, and for their antiscorbutic properties, than for any nutritive value which they may be assumed to possess. Yet even fruits of that character are especially valuable as additions to our daily diet, on account of the potash salts and mild vegetable acids they contribute to the blood. We learn from Johnson's *Vegetable Food of the World* that the grateful acid of the rhubarb stalk arises from the malic acid and binoxalate of potash which it contains. The acidity of the lemon, orange and other species of the genus citrus is caused by the abundance of citric acid which their juices contain; that of the cherry, plum, peach apple and pear from the malic acid in their pulp; that of gooseberries and currants, black, white and red, from a mixture of malic and citric acids; that of grapes from a mixture of malic and tartaric acids; that of the mango from citric acid and a very fugitive essential oil; that of the tamarind from a mixture of citric, malic and tartaric acids; the flavor of asparagus from aspartic acid, found also in the root of the marshmallow; and that of the cucumber from a peculiar poisonous ingredient, called fungin, which is found in many species of fungi, and is the cause of the cucumber being objectionable to some persons.

It will be observed that rhubarb is the only product which contains binoxalate of potash in conjunction with an acid. It is this ingredient which renders rhubarb so wholesome at the early commencemet of the summer, though in certain cases, known to medical men, its use may be injurious.

The following table, compiled from some analyses by Prof. Berard, shows the percentage average chemical composition of five unripe fruits and of eight ripe fruits, comprising apples, pears, gooseberries, grapes, plums, cherries, apricots and peaches :

	Unripe	Ripe.
Water	85.7	78 7
Albuminoids	0 7	0.6
Sugar	4.0	12.9
Vegetable a ids	1.5	1.3
Pectose aod gum	4.3	3 7
Cellulose, etc	3.8	2.8

The data thus given show that there is a considerable decrease in the watery particles of fruit as it approaches its full ripe character, resulting in a difference of 7 per cent, while the sugary constituents increase during maturation in a corresponding degree, rising from an average of 4 to nearly 13 per cent.

There is very little actual decrease in the percentage of acids from the green to the ripe stage of fruits, but the acidity becomes neutralized by the increase of sugar as the fruit approaches maturation.

Many persons know from experience how much more pleasant and agreeable fruit is when gathered and eaten direct from the tree. This is undoubtedly in part due to the freshness and briskness of the vegetable acids contained in the fruit, which, when so gathered and eaten, have not time to change into any other substance. Stale fruit, on the other hand, is unpalatable from the very fact that it has lost this pungent and brisk taste.

Pectose forms the substance known as vegetable jelly, and it is to this constituent of fruit that jams owe their firmness. Cellulose is the fibrous part of fruits, and it is in this portion that we should find the largest proportion of mineral salts, potash, etc.—The Gardener's Chronicle.

The Latest New Explosive.

A new explosive compound is being developed by Prof. Silas R. Divine, chemist to the Rand Drill Co., and well known as the inventor of rackarock. Its peculiar virtue, says the *Engineering News*, is that it is not exploded by concussions of even the most violent character, hut yields readily when a fulminate of mercury detonator is applied. In appearance the explosive is a yellowish powder of high specific gravity. It does not deliquesce and does not have either picric acid or nitrate of ammonia as its active principle. In some recent experiments quantities of the new explosive were placed on a rock and pounded with a heavy sledge-hammer without causing explosion. A shotgun was loaded with a powder charge, and on top, separated only by a thin paper, a half ounce of the new explosive was placed. The gun was fired at a wooden box and portions of the explosive were found imbedded in a scantling inside the box. An old 18-pdr. carronade was next charged with 1½ lbs. of black, blasting powder, and a shell made of linen and tarred cord was filled with 3 lbs. 9 oz. of the new explosive and fired vertically in the air. The shell was arranged with a time fuse terminating in a fulminate of mercury detonator. When fired the shell rose to an altitude of about 2000 ft. and was exploded by the fulminate at that altitude. In another experiment two pieces of 1½ in. iron pipe about 7 ins. long were each filled with the new explosive and buried in the earth side hy side. One of the tubes contained a fulminating cap; the other did not. The first tube was exploded and torn into small hits. The tube beside it was split open and hadly smashed, but the explosive which it contained was unaffected.

These results indicate that the new explosive may be of especial value for military purposes, as it may solve the problem on which Dr. Justin has long heen laboring, and with no small success, of firing shells containing a high explosive with ordinary powder.

Taking the energy of No. 1 dynamite as 100, the energy of this explosive is 86 per unit of weight or 138 per unit of volume. The high specific gravity makes it especially suitable for packing shells and bore-holes, as great power is concentrated in a small space. It is not expensive or dangerous to make in comparison with other high explosives. It does not appear liable to injury or change in character from extreme cold or moderate heat, but, like all forms of powder, is nonexplosive when wet. It is proposed to call the new explosive Randite.

Decoration of Metals.

A new and interesting method of decorating metals is thus set forth in the *Journal of Useful Inventions:*

The decorative design is formed upon the metallic surface by means of etching and oxidation of the metal. Suppose the plate to he decnrated to consist of polished sheet brass. The operator takes the polished plate and covers with a hrush, dipped in a suitable varnish, all those portions of the design which are finally to appear as polished surfaces, the high lights or perhaps the outlines of the design. When the varnish is dry, the plate is immersed in a hath of nitric acid somewhat diluted, in which is a small piece of copper in process of dissolution. By this immersion, the surface of the plate is both etched by the acid and discolored by the action of the copper which is dissolved by the acid. After immersing for a few minutes, the plate is removed and rinsed. As it dries in the air, the exposed surface becomes a dull brown, like old bronze. The operator then paints with the same varnish all the portions that are to retain this color, and then dips the plate in a weak solution of copper salt.

This brightens the surface and gives it a yellowish, mottled appearance. Then the plate is dried in fine sawdust, boxwood preferred. After protecting with the varnish such of this color as it is desired to retain, the operator immerses again the plate in the same nitric acid bath until it has been sufficiently etched to remove the previous oxidation, again rinsing and holding it, either side up, over a tray containing diluted nitric acid and pieces of copper and sheet brass. After having been left to be oxidized in these fumes a few moments, the plate is again dried in sawdust, and the result is an orange color somewhat mottled. Again painted and exposed to the fumes of the acid, copper and brass, for a longer time, a green color is produced. Again dried in the sawdust and painted as before, a frosted effect is produced on the unpainted portion that is left by a quick dip in a hath of nitric or sulphuric acid and water, after which it is rinsed and dried quickly in hot sawdust.

Now the operator removes the varnish with turpentine or another solvent, and the entire design is exposed, and the plate is completed.

It is immaterial, after pointing over the high lights, in what order the successive oxidations are produced, but it is preferable to oxidize the finer and more delicate portions of the design first, and finish with the ground etching. The depth of the etchings is of no consequence, the color, like heauty, being only skin deep.

The varnish which the inventor prefers is made as follows: Asphaltum, two ounces; white wax, 1½ ounces; Burgundy pitch, one ounce; and turpentine. Melt the asphaltum in a glazed saucepan, and add the wax gradually, stirring with a glass rod; add the pitch and continue stirring, permitting it to boil up two or three times, but never let it boil over.

Take the saucepan from the fire and stir in enough turpentine to make it the consistency of tube oil paints. Other colors, such as dark purple and orange, red and green, green hronze and light green, bright green and red, hright pink, iridescent purple, may be made by the same method with various kinds of haths.

Mechanical Progress.

How to Temper a Spring.

Tempering a spring is not the hard job which some smiths, professional as well as amateur, seem to make of it. In getting ready to temper a spring, one should begio with the forging itself, for if that be not well done, no amount of "know-how" can make a success of the tempering. The forging should be done with low heats and light blows, and the steel should not be hammered while cold, with heavy blows at least. Avoid making hammer marks in the steel when forging, for although such marks may be worked out, they do not add to the strength or long life of the spring. A good many failures of seemingly perfect springs could doubtless be traced to this little point in the forging. After the spring has been hammered to size, spend a little extra time in lightly hammering the steel when it is nearly cold—but don't strike hard.

The light hammering will toughen the steel, and make a better spring. The outside surface or "skin" seems better adapted to spring work, where the surface is hammered up, instead of heing filed or ground. After done hammering, polish the spring with a bit of emery paper. It is hest not to put it on an emery wheel, for then the skin above described would be destroyed. Sometimes, however, it is necessary to partly shape the spring by grinding, but if possible let this be done at an early stage of the job, so that the outside skin may be restored as much as possible. When ready for the hardening, there are two ways of doing the heating, either by holding the spring over a clean fire with a small pair of tongs, keeping the spring high up so as to heat slowly, or by first heating a heavy piece of iron red-hot, and then placing the spring on that until the steel is heated.

A modification of the latter method is to heat some lead red-hot in a ladle and plunge the spring in that, but when this is done, the spring should first be heated in the fire until it is at least black-hot, that the sudden shock of meeting the red-hot lead may not cause disastrous strains in the steel. When the spring is fully and uniformly heated to a light red, plunge into cool hut not ice-cold water. The amount of twist that is got into the spring by this operation depends on the manner in which the spring is put into the water. If it be put in so that a flat side touches first, the sudden cooling of that side will cause the spring to he pulled out of shape, and held there by the subsequent cooling of the rest of the spring. If put into the water endwise, or straight, there will he but little distortion of the spring.

After hardening, polish the spring with a bit of emery cloth until the metal is bright, clean and white. Then put a few drops of oil on a bit of paper, light it, and hold under the spring until every portion of its surface is covered with a thick coating of smoke. Next heat the spring slowly, holding it high up over the forge fire, until the smoke is all burned off; but it should all go alike. Don't let one part of the spring get so hot that the smoke is all burned off, while another part is thickly coated. That means a spring with uneven temper, that will break in short order. When the smoke has been carefully burned off, lay the spring on the ashes of the forge to cool slowly, and in a few minutes it will be ready for work.—The Tradesman.

THE ROSE GAS PROCESS.—The Rose fuel gas apparatus now in operation at West Chester, Pa., makes in one hour as much gas as was made formerly in 12 hours, a recent test showing 23,500 cubic feet in an hour's time The two holders now in use have a capacity of 24,000 and 55,000 cuhic feet, but the machinery is only run several hours alternate days as the green gas has to he exhausted from one holder to the other at a rate of ahout 4000 feet per hour, though machinery will shortly he installed to exhaust 14,000 or 15 000 feet per hour. In a separate building is stored about 8000 gallons of crude oil, which is used in the manufacture of the gas at the rate of about 3¾ gallons per 1000 cubic feet of gas. The oil is pumped to a tank on the roof of the building from whence, by gravity, it goes to the furnace and mingles with the coke. But one man is now employed, who does the work formerly done by four or five men. An expert from Philadelphia made a test of the gas a few days ago, and reported that candle power was 30.2 and the specific gravity .600, and the heat units per foot, 698. Only four gallons of crude oil per 1000 feet were used. This gas is being sold for fuel purposes at 75 cents per 1000 feet where the consumer uses more than 5000 feet per month. The cost of it with coal at $2 90 and coke at $3 80 per ton and oil at 2¾ cents per gallon, is 20 cents per 1000 feet delivered in the holder. The Rose process is new in several respects. Steam is decomposed with bituminous coal enriched with crude oil, and the gas is fixed with red-hot coke. The product is not strictly a water-gas, as it only contains about nine per cent of carbonic oxide. It is very rich marsh gas hydrogen, hence its high heating power. One man is managing the West Chester machine and producing gas at the rate of 20,000 feet per hour.—*American Manufacturer.*

MAKING ANTIQUE OAK.—There are one hundred methods for darkening oak, some of them heing fairly good, and some of them being decidedly bad, but one of the best methods, and one that never fails, is the fumigation of oak with ammoniacal vapor. When the work is ready to be darkened, place it in an approximately *air tight* room in which no light enters; for small work a packing-box will answer if the joints or cracks are covered with paper being pasted over them. Place the doors, furniture or other work in this room—a hox—and place in the room a flat porcelain or earth en vessel filled with amm nia. See that the vessel containing the liquid is placed on the ground or floor, so that the fumes or vapor will strike the articles designed to be darkened. If the room or box is large, two or more vessels containing ammonia may be placed on the floor and left there until the wood is sufficiently dark. Of course, all openings in the room or box must be closed up, or the fumes will escape. Remember that the ammonia does not touch the oak, but the gas that comes from it acts in a wondrous manner upon the tannic acid in that wood, and browns it so deeply that a shaving or two may actually be taken off without removing the color. The depth of shade will entirely depend upon the quantity of ammonia used and the time the wood is exposed. Try an odd bit first, experimentally, and then use your own judgment.—Operative Builder.

COMPRESSING COTTON. — The adoption throughout the South of the roller cotton compress, which by a process simple in principle, and using no more power than is required for the plantation bale, will, says the *Manufacturers' Gazette*, it is anticipated, become very general; the capacity of the apparatus heing equal to turning out a bale of less hulk, greater density, and of more even and smooth exterior than the large steam compresses make. The invention is expected to take the place of hoth the plantation press of to-day and the big compresses scattered over the country. Substituted for the ordinary plantation press, it will take the cotton right from the gin and turn out a 500-pound bale as small as, if not smaller, than a bale that has been crushed in the powerful hydraulic presses that are located at the various shipping points; and a bale from the roller compress is ready to put on the cars and be shipped direct to the mill, saving, of course, the charge and expense of unloading and reloading, and doing away with one set of middlemen altogether. The amount of money that is paid out annually for compressing the hales after they have left the country gins is very large, and this, it is claimed, is by this apparatus saved to producers and consumers alike.

FERRULING BOILER TUBES.—An exhaustive test of the new method of ferruling the tubes of leaky boilers, which was made at the direction of the British Admiralty, has had a successful result. The Thunderer was selected as the vessel best suited to conduct the test. She recently returned from an experimental trip to Madeira, having steamed continuously at four-fifths full power during the passage out and at a slightly increased pressure on the homeward journey when meeting head winds The hoilers showed no sign of leaking, and out of a total of 3000 ferrules fitted to the tubes only three were found defective. The *Record* considers that this test settles the question, and estimates that at the present time there are boilers in British Naval vessels, representing a value of over £150,000, that can he made efficient by this plan of ferruling, which would otherwise be condemned. The ferrules are very easily fitted, being simply driven into the ends of the boiler tubes without screwing or o her appliance. The ferrule has an overlapping flange, with an air space, which is claimed to preserve the end of the tube from the action of the fire close to the hoiler plate.

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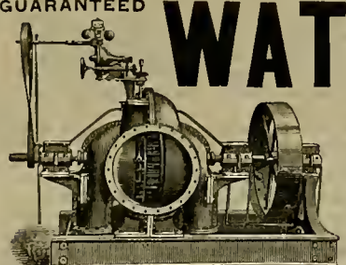

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Useful Information.

Insect Illumination.

The secretary of the Smithsonian Institute, Prof. Langley, has been recently experimenting with Cuban fireflies with view to discovering the manner in which the illumination they emit is generated. He says that the light that they give is the cheapest in the world produced, that, is to say, with the least heat and the smallest expenditure of energy—and he believes that a successful imitation of it would prove a most profitable substitute for gas or electricity. The insects are beetles two inches long, and belong to the family of "snapping bugs," so called because when one is laid upon its back it snaps itself into the air with a clicking sound. The secret of the light this firefly gives is as yet undiscovered. Apparently it is conected in some way with the mysterious phenomena of life, and chemists and physicists have sought in vain to explain its origin. On each side of the animal's thorax is a luminous, membranous spot, and these flash at intervals, so that the Cubans put a dozen of the insects in a cage together and so obtain a continuous illumination, bright enough to read by. This light is accompanied by no perceptible heat, and is seemingly produced with almost no expenditure of energy. How great an improvement it represents upon all known artificial lights can be imagined when it is stated that in candle light, lamp light or gas light, the waste is more than 99 per cent. In other words, if they could he so obtained as not to throw anything away, they would give nearly one hundred times the illumination they do afford. Even the electric light is mostly waste.

COAL MEASURES.—The coal deposits that are tributary to Castle, Mont., are awakening the interest here that their value will soon command. Of late, a large number of locations has been made. It is said by those who are familiar with the surface showings here that they are superior to those seen by them in other coal districts in the State. The measures here lie to the south of the town, and to the northeast and southeast of this place. Fifteen miles in a northeasterly direction from here are some good veins, over a foot in width outcrop. From there the coal indications are traced to within 2½ to 3 miles of Castle. Near the town, veins from 4 to 6 feet wide have been exposed within a few feet of the surface. From there south for 17 miles there are abundant external evidences that large measures of coal underlie the country. On Sixteen-Mile creek, which derives its name on account of its distance from Castle, the deepest workings exist. There a 12-foot seam within 100 feet of the surface has been uncovered. The grade of coal of this district is supposed to belong to the Laramie period of the Cretaceous age, which for quality is considered the second best among the coals found in this intermountain country. With such abundant natural resources as this place possesses, it is not unnatural to suppose that a railroad from either the places that covet one to Castle would he a paying proposition from the start.—Castle Trihune.

GRAPHITE AND GRAPHITITE.—Graphite plays an important part in the manufacture of arc-light carbons, and has in the process to be first of all finely powdered. According to some researches of W. Luzi (*Deutsch. Chem. Gesellschaft*, Vol. XXIV,) certain kinds of graphite, which he proposes to call *graphitite*, may be very easily reduced to powder by chemical means. It has been known for some time that graphite boiled in certain reagents, and then washed and dried, swelled in a most extraordinary fashion when baked. These reagents were concentrated sulphuric acid and a mixture of concentrated sulphuric and nitric acid. W. Luzi finds that fuming nitric acid is also a reagent. The graphite which exhibits this peculiarity of swelling comes from the following sources: Ticonderoga, Pfafferreuth, Ceylon, Buckingham (Canada), Argenteuil (Canada), Massachusetts, Amity (N. Y.), Greenville (Ont.). The so-called graphitite comes from Passa (Siberia), New Mexico, Burkhardtswald (Saxony), Idar, Fichuelgebirge, Diedelkopf (Tyrol), Levigliani (Italy).

PREVENTING DUST IN MINES.—In some of the German mines a new method has been successfully introduced for preventing coal-dust explosions, in place of the usual practice of sprinkling water in dusty parts of the mine, this plan having only a limited utility, as the dust is generated by the breakdown of the coal, and explosions may arise from the liberation of gases at the same instant. To meet these circumstances, the use of water has had an entirely new application, and with a result remarkably satisfactory. Holes of one meter depth are drilled at a distance from each other of about three meters, wooden plugs are inserted, and through them iron pipes from three quarters to one meter long, with openings between 2½ to 3 millimeters large, and connected with rubber hose. It appears that in the Camphausen colliery a pressure of from eight to ten atmospheres and injection through two tuhes in eight hours proved sufficient to impregnate 6x1x1½ meters, and in another case, that of the Kreuzgraben colliery, the water forced in under a pressure of 20 atmospheres during 16 hours moistened thoroughly the coal as far as as four meters above the highest hole. In carrying out this method, primary regard is to be paid to the water pressure ohtainable, the quantity of the water injected, and the firmness of the seam, the latter depending somewhat on the size of the coal-pillars in the workings.

COAL CUTTING BY MACHINERY.—The undercutting of coal by machinery is now claimed to he greatly facilitated by means of a newly designed arc apparatus, involving, it is asserted, a decided improvement on the usual principle of construction in vogue. A heavy iron base, cast in one piece, serves as a foundation for all the parts, carrying two pairs of axles, one at right angles with the other; the gauge of one pair is fixed to suit the regular track gauge of the mine in in which the cutter is to work, and these axles carry small-flanged wheels upon which the cutter is easily moved about the mine, and in and out, according to requirement. The second pair of axles carry small wheels for supporting the cutter when in actual operation and carrying it along the face of the wall being cut; they are not flanged, but kept on the track by two pairs of single and two pairs of double guides, and the support of the machine is easily changed from one pair of axles to the other by means of a cam worked by screws, the larger-flanged wheels being raised out of the way when the cutter is moving. The motor power is furnished by a 15 h. p. motor, which is perfectly watertight and thoroughly protected from all danger of mechanical injury. The armature shaft carries a bevelled gear, thus giving the shaft on the right a right-handed or left-handed rotation, and, by an ingenious arrangement, this shaft operates the feed chain at practically any desired speed.

SAFETY VALVES.—You may do all the figuring you want to about safety valves, but if the one you have has not capacity enough to discharge all the steam that the boiler can make with the fiercest fire that you can build under it, and with all the other escapes closed, it is not a safety valve; it is worse than nothing, because it will give you a false confidence. Try it some day with a moderate fire, and if you find that the pressure on the gage rises above that at which the valve should blow off, you may be sure that in time of real danger, when there is no one by to control the fire, the valve will fail to do what it is intended to do. Better not rely upon one valve only; best to have two, with one opening in the shell, but each having its distinct case and discharge. Safety valves don't cost nearly so much as blow-ups and funerals. A safety valve of too limited capacity is like a dummy lightning rod, worse than nothing at all. The practical test, better than mere figuring out what it will discharge, is to try its discharging capacity as against the boiler's generating powers with a moderate fire, as I have said. If it fails in this, double up.—Ex.

SHARPENING BY ACIDS.—It has long been known, says a contemporary, that instruments and tools, such as knives, shears, scythes and files, which have become blunt hy use, may again have a keen edge imparted to them hy means of acids, as well as by the common methods of sharpening and whetting. But, so far, the less usual process does not appear to have met with the favor which its merits deserve. All dilute mineral acids are adapted for tool-sharpening. For example, 10 parts of sulphuric acid hydrate to 100 parts of water. The desired end is more quickly attained if a portion of the sulphuric acid be replaced by nitric acid. A suitable mix ure is, 1 litre of water, 50 grammes of Chile saltpeter and 60 cubic centimeters of concentrated sulphuric acid. This compound dissolves 1½ grammes of metal within ten minutes from an iron surface of one square centimeter. Dissolution is slower where su phuric acid alone is used. Steel is acted upon in the same manner as iron, with the exception that the process is not so rapid because of the polished surface becoming covered with a thin deposit of separated carbon. It has been sought to strengthen the action of the acids, or, in other words, to shorten their period of action, by attracting the electrical resistance of the iron with gas retort coal or with other metals; but up to the present no substantial advantage has accrued from this method. In order to secure as uniform an acid action as possible, preliminary cleaning of the metallic surfaces, preferably wirh a soda solution, is recommended.

THE BEST DEPOSITS OF TIN.—The mineral resources of the Indian or Malay Archipelago are known to be very great, but up to the present systematic mining operations have been confined to the wonderfully rich and pure stanniferous deposits of the islands of Banca and Billiton. The tin obtained from the ores fonnd in this part of the globe is the most unsophistical produced. A recent analysis of Banca metal gave the following results: Tin, 99 961 per cent; iron, 00.019; lead, 00.014; copper, 00 006; total, 100. According to the latest statistics available, there are in the island of Banca some 200 mines worked by private companies, while abou' one-half that number is exploited by .ne Dutch Government. The island itself is divided into nine mining districts. The miners are members of the Kongsis or Chinese tr. des-unions, which effect the labor contracts with the Government. The cost of production in the last fiscal period amounted to 26.14 Dutch florins per picul, a weight of approximately 135 pounds. The sale price attained an average price of 83.82 Dutch florins, so that hy a total output of 65,964 piculs a net profit of 2,805 000 gulden, or £233,750, accrued to the Government of the Netherlands. The mines on the island of Billiton are in the possession of a private concern. This organization pays a royalty to the Government of 3 per cent of the gross annual yield. In the preceding financial year the authorities received under this agreemeet 2376 piculs, out of a total of 76,183 piculs, a quantity which realized on sale about £17,000. The mining board which controls the government works is an offshot of the Dutch ministry of commerce, and it consists of 15 engineers and 24 overseers.

BURNING LIME WITH OIL FUEL.—A Maine concern has been experimenting for some time on a process of burning lime with oil instead of wood. The oil for use at the Warren kilns is stored in a huge tank holding 10,500 gallons, from which it is pumped into a pressure-tank of 150 gallons capacity, and a 20-pound pressure is applied. The oil is purified by passing it through water, and a meter is attached to the kiln. Each kiln has two arches, and two pipes run to each arch. One pipe carries the oil, the other, steam to force the burning oil up among the limerock. The heat produced is intense, making it necessary to draw eight times a day. The lime produced by the oil process is whiter than that burned with wood, and is claimed to be of better quality.

THE following directions for joining band saws are given by the Defiance Machine Works: Bevel each end of the saw the length of two teeth. Make a good joint. Fasten the saw in brazing clamps with the back against the shoulder, and wet the joints with solder water, or with a creamy mixture made by rubbing a lump of borax in a teaspoonful of water on a slate. Put in the joint a piece of silver solder the full size thereof, and clamp with tongs heated to a light red (not white) heat. As soon as the solder fuses, blacken the tongs with water, and take them off. Remove the saw, hammer it if necessary, file down to an even thickness, finishing by draw-filing lengthwise.

IN a lecture on fire prevention, Prof. Goodman again called attention to the value of wooden joists for building purposes, as compared with iron and steel. He explained that the two latter materials lose their strength at a not very high temperature, whereas wood will sustain a heavy strain for a much longer period when exposed to great heat.

THE various colors of flame in a wood fire are caused by the combustion of the elements of the fuel. The light hlue is from the hydrogen, the white from carbon, the violet from manganese, the red from magnesia and the yellow from soda.

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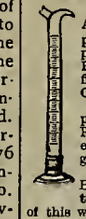

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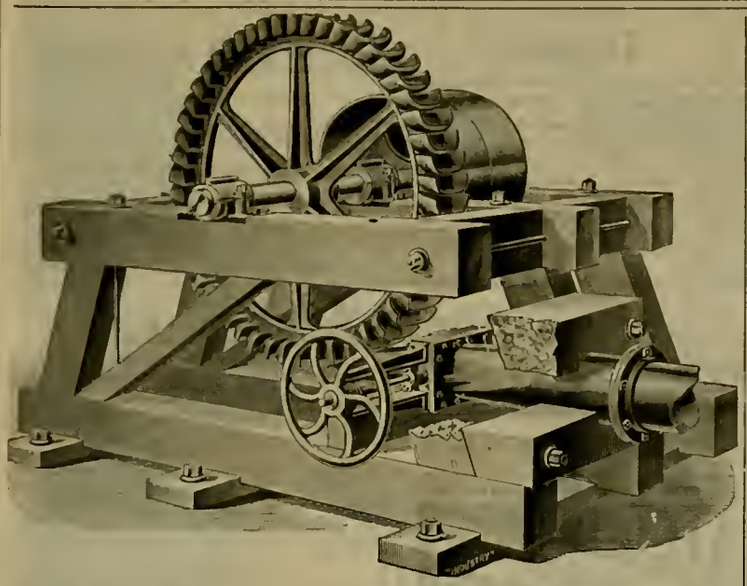

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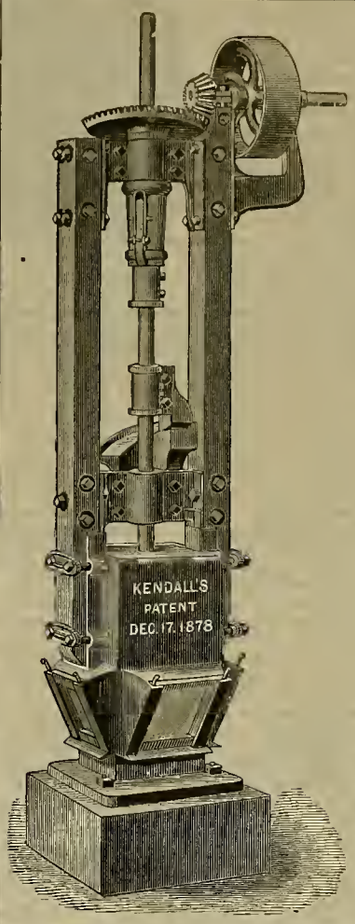

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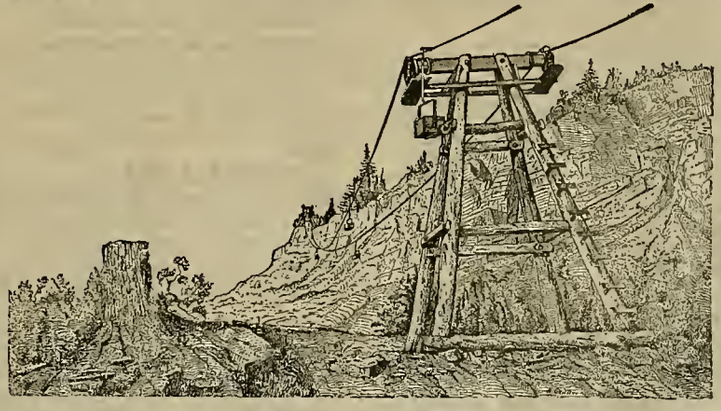

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A German contemporary contains a full account, with plans and drawings, of two cases of injury to gas pipes recently caused in Berlin by electric cables. In one of these cases, a cable-bnx, into which 12 cables passed, exploded with a flame, and it was observed immediately after that all the gas flames down one side of the street had gone out, and these could not be lighted again. There was no escape of gas after the explosion. The wires were in close proximity to a gas pipe of 4.2 inches diameter. The leather washer of the nearest street-lamp connection was burned; the next two were looseoed; the next was completely destroyed. Then a bit of the gas pipe was destroyed, along with the lead of the coupling at a joint, and the melted mixture of iron and lead had been driven up a 22 inch pipe, which was itself destroyed and perforated in a most extraordinary way. The electricians were three days repairing the damage to their various cables in the neighborhood. The telephone wires in the vicinity were also interfered with, and a new telegraph wire had to be laid, 50 yards of it having been burned. There appears to be no doubt that the insulation of the electric cable had given way, and that the current had forced itself from the outer coating across to the near gas pipe.

In the second case, a fortnight later, a Siemens street lamp burst into a huge flame, showing that a pipe had suddenly burst inside the pillar. The pneumatic-post system was also deranged, the tube being blocked, and gas steamed through the tube into the postoffice. A cable crossing the pneumatic postal-tube was destroyed for about two feet of its length; the pneumatic tube had its joints melted up and became blocked, and the current had run off to the street lamp and melted two holes in its iron-supply and nearly melted a third, and had damaged the service pipe and the main; and had, besides, run off to other electric cables and burned them up. After it was thought that all damages were repaired, the smell of escaping gas remained exceedingly strong, and then it was found that the current had also burned a hole in the 10.4-inch pipes of the English Gas Company, this hole being four inches in diameter, and the pipe being separated from the cable by a space of 0.8 inch, packed with earth. One curious feature was the burning of a hole in an iron pipe on the side remote from the electric cable.—Invention.

APPARATUS FOR TWISTING METALS.—An outcome of the increasing use of electrical heating is the electrical metal-twisting machine. This is used in the production of twisted metal bars, which are largely utilized for stair rods, fence pickets, office partitions, elevators and other ornamental work. It is found that where the electric current is employed for heating bar-shaped blanks, the metal heats from the interior instead of from the exterior, as in the ordinary blacksmith's forge; also that there are 00 gases introduced into the metal when it is electrically heated, and coosequently when the blank is twisted no scale is formed, and the metal is left clear and free from blemishes. Another point which, under the conditions, is a great advantage, is that the bars retain the electrically produced heat longer than that of the ordinary surface-heating forge. The metal bar to be twisted is held securely in place by a clamp at each end and a central clamp. The current is then switched on, and in a few seconds that portion of the metal rod which spans the space between the clamps is heated to a forging temperature, while the parts which are directly in contact with the end clamps remain cool. As soon as the current is switched off, the central clamp is released from the bar. A crank at the side of the machine is then turned, the end of the bar being still held in this clamp, and the rotation of this shaft causes the rotation of the bar. The degree of twisting, which is effected in an instant, can be accurately regulated.

STORAGE SYSTEM.—Pedro G. Salom is an earnest champion of the storage battery system of street railway propulsion. In a lecture delivered before the Franklin Institute in June, Mr. Salom, who is widely known in the iron trade, accounts for the delay in introducing storage batteries by the intense patent litigation on the subject during the last five years. He cites a record at the Citizens' Passenger Railway in Indianapolis, showing that a single set of 108 accumulators made over 6000 car miles. On the basis of this achievement, he places the cost at 3 85 cents per car mile. He urges that there are no insurmountable difficulties connected with the storage system beyond the fact that it costs a few cents more per car mile than the trolley, and holds that the demand for its introduction will be irresistible when the disadvantages to the public of the trolley are taken into account.—Iron Age.

THE "STUDY" OF ELECTRICITY.—The rapid growth of the industrial applications of electricity has placed the study of electrotechnichs on a footing with the older branches of engineering, if, indeed, it has not already outstripped them. Statistics show that the number of students who choose the electrical studies at our larger universities and technical schools is yearly increasing. At Cornell University, for instance, the number has increased from 28 in 1884 to 250 in 1892; and this is only a specimen of the continued growth in other institutions. Evidence is not wanting that the coming year will be no less a prosperous one in this respect for the universities than preceding ones. We receive almost daily, communications from men of all ages and engaged in a great variety of occupations, asking for advice and direction in the choice of a method of securing an electrical education, or for assistance in the selection of an institution at which the study of electrical engineering may be pursued to the greatest advantage. Of course this is a question to which a definite answer can only be given for each individual case, as the circumstances of the student, the means at his command, his age, his previous training, either in the school or the shop, must be considered. There is undoubtedly a tendency among the younger men who have been trained in the shop to take a partial or complete course in electrical engineering at some reputable university whenever circumstances will permit of it.—Electrical World.

RUSSIA has long been the source of supply of platinum for electrical purposes, large quantities of it being required in the manufacture of incandescent lamps, which would be much cheaper if an efficient substitute for it could be found. Canadian platinum has now made its way into the market and the product promises to be large in time, says an exchange. It comes from British Columbia and is met with in association with alluvial gold. The Tulamen district yields it in grains and nuggets. One firm in the United States is reported to have bought 2000 ounces within the last year or two, and another portion of the yield has been marketed in England. Time was, and not long ago, when incandescent lamp manufacturers were giving high prices for the butts of old lamps, so that they might recover the platinum stems used to connect the carbon filaments with the outside circuits.

THE ELECTRIC CURRENT IN THE DETECTION OF TORPEDOES.—The electric current which is used for the propulsion of torpedoes is now used for their detection, as well as for that of mines in harbors and channels. The apparatus employed is very simple and can be easily carried in a small boat. It comprises a metal sinker and a telephone, with batteries and induction coils. The sinker, which is attached to a small cable, is dragged along the bottom of the harbor where the presence of torpedoes is suspected. The operator in the boat or launch places the telephone to his ear and listens attentively. As soon as the sinker approaches a metallic body, such as a torpedo, a buzzing noise is heard; and this noise increases as the distance between the sinker and the torpedo is lessened, and becomes loudest when the two metals come into contact.

NO STRONGER evidence of the safety of electric-lighting installations can be afforded than by the fact that many gunpowder factories are now being lighted by electricity. It is obvious that in a building wherein the preparation of inflammable or highly explosive substances is carried on, very special care should be taken in order to avoid even the smallest risk, and powder manufacturers now find that the electric light adds a considerable percentage over gas to the chances of safe operation.

ELECTRICAL MACHINES are employed in England for removing miners' wedges, tools and picks out of coal before grinding for coke making. The material is passed through a revolving cylinder fitted with many pole pieces, which, being magnetized, attract all the pieces of iron and steel to them, and hold them fast until the current is taken off.

IT has been found that incandescent lamps, especially those with long filaments, are shorter lived when mounted in a horizontal position or in a position upwardly inclined from the horizontal.

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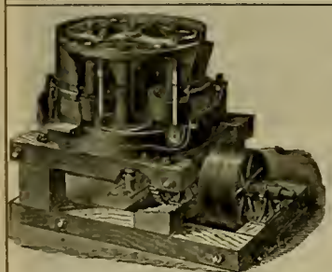

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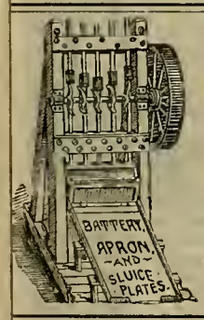

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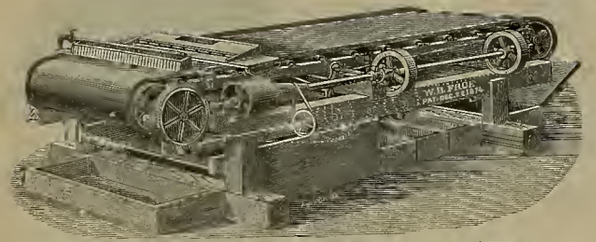

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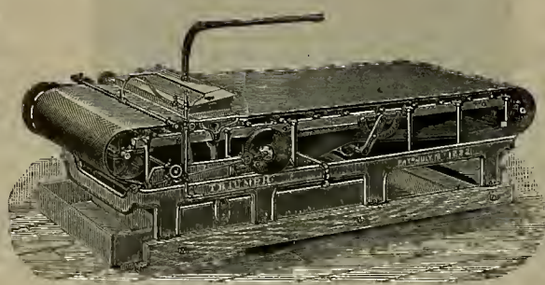

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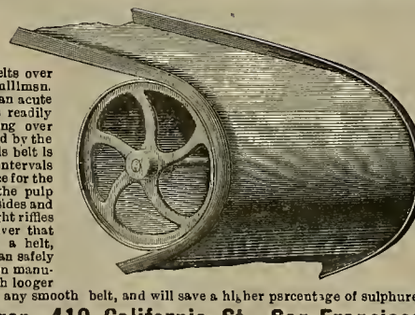

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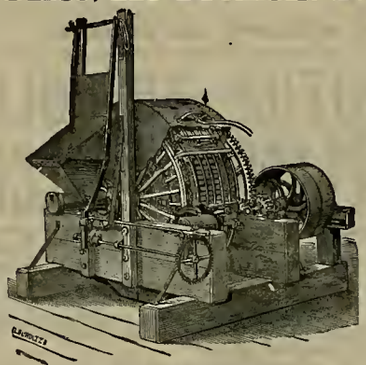

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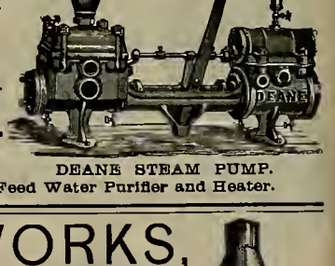

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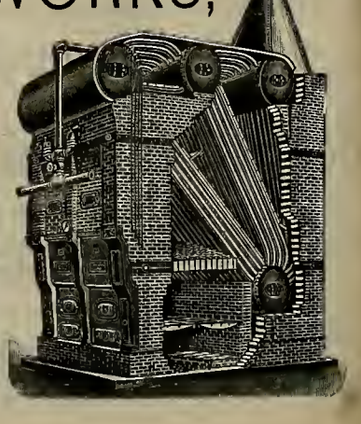

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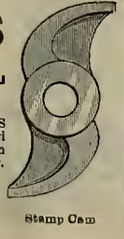

Stamp Cam

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Sept. 3: All preparations for sinking in the Wildman mine have been abandoned. They have concluded to further explore the levels already opened up, and in all probability sinking will not be undertaken until late in the fall, as by that time not only will the mine be more extensively developed, but the air, in consequence of cold water, will be much better, which will be a material advantage to the miners. Exploring in the South Eureka is forging along, but the development of good pay rock is yet to come. The rock encountered so far is not of a milling character, though the ledge is of good size. They are still crosscutting west and have reached a distance of 200 feet. The ground continues to get softer, which is a good indication, and they hope when the ledge is found that it will be gold-bearing. Drifting on the ledge will be continued for some time yet. Everything is moving along slowly but surely at the Hector. All preparations are about completed for the starting of the mill. Rock is to be run into the dumps right away; the big bin between the mine and mill is now finished. It has chutes which conduct the ore into the cars and it is then run to the mill, a distance of 150 feet. At the Belmont they have crosscut 20 feet west at the 200-foot level, and have struck a fair-sized ledge and the rock prospects fairly well, and no doubt will pay. Mr. Tibbitt's ambition is to go deeper, when he feels very confident of opening up one of the best paying mines of the county. Charles Smith has two or three men running surface dirt into the Lincoln mill, and he expects to make good wages.

HECTOR. — Amador *Record*, Sept. 1: Some pretty extensive work is being done at the Hector mine and the improvements under headway are of a character that show that the property is in be put in shape for extensive and permanent working. The new ore bin midway between the hoisting works and mill is about completed, and the air-compressor being placed below the mill will soon be in readiness. Air pipe is to be put in to the 700 level and the water is kept down to that depth. A station is being built on the 600 level, which level will furnish ore for the mill at present. It is expected to start up the 40-stamp mill between now and the 15th, and there is sufficient ore opened up to keep it running right along. The operation of this mine on the scale proposed will add considerably to the business interests of this section. The steady running of a 40-stamp mill necessarily means the employment of a goodly crew of men.

Butte.

GOOD PROSPECTS.—Oroville *Register*, Sept. 1: Supt. F. J. Houghton of the Rainbow mine was in Oroville yesterday and, in response to questions, said that the outlook for the Rainbow was bright. They began at the 100-foot level with a ledge 16 inches wide and are now down 200 feet and the ledge has constantly increased in size. The mill has been running a month and the receipts are satisfactory. The mining outlook at Hurleton is getting better every day. There are many good ledges that will pay well to work and the main object is to attract capital so as to develop them.

VERY RICH QUARTZ.—W. W. McMillan was in town on Monday and showed us some extremely rich quartz taken from a shaft 26 feet deep on the Phœnix Extension near Hurleton. The mine is bonded to Col. A. P. Frary, and if the ore in it looks like the quartz McMillan showed us it is worth a fortune. Some of the pieces were apparently half gold and all the specimens were very rich. He estimates such quartz would be worth $10,000 a ton. The main ledge is about two feet wide, but this is a stringer coming in from one side. The shaft on the Phœnix is down 95 feet and the ledge is four feet in width. Col. Frary is in San Francisco and it is thought arrangements will at once be made for putting on machinery so as to more fully develop the lode which is exceedingly promising.

Calaveras.

MURPHYS MINES.—San Andreas *Citizen*, Sept. 3: Advices from the Washington mine, managed by Colin Campbell, at Indian Creek, are to the effect that two men have been steadily employed for some time past. A larger force will be put on in the near future, as a good vein of ore of average width has been discovered in the old and original tunnel. It is not the disposition of the energetic gentleman at the helm of this enterprise to abandon operations upon short notice. As far as practicable the work has been continued and the outlook now is that more chutes are opening up for inspection. This is to be hoped for, as there is a good mill upon the mine and everything in perfect readiness for operations upon short notice. Everything in and around the Beatrice mine, near town, is being pushed with astonishing vim. It is apparent that it will not be long before matters will assume an enterprising aspect that has seldom been equaled in the vicinity. The mill grade is fast nearing completion. Work is going on with a systematic vim. A boarding-house and also a lodging-house has just been built near the mine. Supt. Hardy went to the city several days ago and is expected back tonight, 29th inst.

Plumas.

IRON-ORE DEPOSITS.—*National Bulletin*, Sept. 1: We are in receipt of a sample of iron ore from the Sierra iron mine, which is located on the line between Plumas and Sierra counties, south of the Plumas Eureka mine. It was presented by S. S. Taylor, who is collecting for the World's Fair exhibit. In this mine is a vast deposit of magnetic iron ore which, when the railroad through Plumas is completed, will become of great value.

San Diego.

PERRIS VALLEY MINES.—Perris *New Era*, Sept. 1: The Good Hope mine is without doubt one of the best gold mines in California, but who, outside of a few, has ever heard of it? It has been running along silently for years, giving up its glittering metal and enriching its owners. About half a mile northwest from the Good Hope, and four and a half miles from Perris, lies the property recently purchased by the Gold Prince M. Co., of which H. A. Thompson of New York is president; R. H. Falkenburg (Captain Dick) is general manager, and Robert L. Binford, secretary. The property lies on patented land formerly owned by Mr. Woodward, and embraces 60 acres. It is well-wooded and watered and easy of approach, and being in close proximity to the Southern California railroad, every facility is afforded for cheap and successful development. The ledge is evidently a continuation of the Good Hope and is tapped by three shafts, in each of which the vein has been uncovered. The ore in the ledges is of a white quartz, strongly marked with iron, and carries both free gold and sulphurets. Assays of the ore have varied, ranging in value from two or three dollars to the hundreds, but a fair and conservative estimate would place the average at not less than $20 per ton. Since the Gold Prince Co. has taken the management of the mine, now only a month, a large amount of tunneling, sinking and timbering has been done, besides the constructing of offices, men's sleeping-house, mess-house and sheds, and a temporary hoisting works. The latter is run by a 40-horsepower boiler and is capable of raising 20 or 35 tons of ore per day. At present about 15 men are employed about the works, under the foremanship of Walter Murray, an experienced Comstock miner, but this force will be increased as soon as room is made in the mine for more men. It is the intention of the company to thoroughly prospect the mine, and with that end in view the shafts will be pushed to a depth of 200 feet at least, before millwork will begin. This they expect to accomplish in about two months, at which time a Bryan or Crawford rollermill will be put in position. These mills comprise the latest improvements in mining machinery and are capable of crushing 25 tons of rock in a 12-hour run. Another improvement will be the addition of an electric plant, by which all the inner and outer works will be lighted. The Gold Prince Co. has gone to work in earnest to develop and make a paying mine of the property, and in their efforts to accomplish this they cannot but have the best wishes of the people of this valley. Captain Crossman started work yesterday on the Rosalia mine, in the Gavilan district. In this work he has interested Riverside capital and he will thoroughly develop the property. The Virginia mine, six miles west of Perris, has been sold by Perry Shay to a syndicate represented by Captain Strong, who will commence immediately the work of developing it.

Shasta.

IGO SILVER DISTRICT.—Redding *Free Press*, Sept. 3: The owner of the Richmond mine, John P. Wright, has been taking out some rich ore averaging 100 ounces per ton; his shipping ore yields 300 ounces per ton. There are two shafts on the ledge, each 50 feet deep, with a tunnel 65 feet long between the two. The vein runs a little east of north and the dip is almost perpendicular. On this hill some good claims are being worked. It is bounded on the north and east by the South Fork of Clear creek, and on the south and west by Andrews' creek. The Chicago mine is on the north side and extends across the summit. At present nothing is being done on this property, but on the adjoining claim, which is an extension, William Gillon has drifted to the west on the ledge and sunk a shaft that is now ten feet deep. The ledge shows an increasing width and has a strip along the footwall that carries rich ochre ore, some of which contains a large percentage of gold. The ledge matter carries about 100 ounces silver to the ton. South of Mr. Wright is the Pilchuck mine. Mr. Lewis is working steadily and his mine is turning out some rich ore. A shaft has been sunk and a tunnel has been run to crosscut the ledge. Near by is another claim owned by Mr. Lewis. His partner, Mr. Eubanks, a captain in the Salvation Army, is hard at work running a tunnel to crosscut the vein, with every prospect of opening up a good property. The Crystal mine is also working steadily. It is on this side of the hill that reduction works should have been erected, and no better enterprise could be undertaken in the county than the putting up of a good working plant on Andrews' creek. The Yount Co.'s works on the other side of the hill have somehow come to a standstill. It is not for want of ores to handle that the works have not been completed. These half-hearted enterprises do an injury to the district and to the county. A disagreement about the method of working some of the ores seems to be one of the difficulties, but, whatever they may be, it is time that things were settled and the plant put in running order. On the South Fork side W. D. Bull is putting in some good work on the Lodi mine. This mine is on an adjoining section to the Wright group. Mr. Bull has sunk a shaft 40 feet and is drifting along the ledge, which shows strong and keeps its width. Selby's returns average $250 in silver and $27.67 in gold to the ton. There is about 12 per cent lead in this ore. Mr. Streator and others have good claims on this section and there must be a very rich one somewhere close by, as there are indications of a contact—slate and porphyry, slate and granite—in this neighborhood. So far all the veins have been found in a granite formation, with well-defined walls and a clean and sometimes very wide gouge. This district offers excellent opportunities to prospectors and investors.

CYANIDE BULLION.—At the Bank of Shasta County can be seen a small bar of bullion from the Shasta mill, working the MacArthur-Forrest cyanide process. The bullion is as bright as a $20 gold piece, and one can hardly realize that so heavy a substance has been in solution. The process is working highly satisfactory.

NOTES.—The Calumet Co. is now working three mines on Flat creek. Only a small part of the Calumet works is now running, on account of slackness of water. The Calumet Co. is going to put an ore cable across the Sacramento river for delivering ore to their mill on the east side. There are four or five persons with rockers washing out gold at the bend of the river below Ben Oliver's old fishery, a quarter of a mile from town. They wade into the river, scoop up the rich sand and wash it in their rockers, making as high as $2.50 and $3 a day. This place has been worked off and on successfully ever since and even before Redding was a city.

Sierra.

NEAR GRAVEL.—*Mt. Messenger*, Sept. 3: At latest advices, this week, from the Maple Grove drift mine, Alleghany, the tunnel was within 18 feet of the pay gravel, found in the shaft months ago, which prospected $10 to the carload. Eighteen feet were made with the tunnel last week.

Siskiyou.

TO START.—Yreka *Journal*, Sept. 1: The Ballarat Co. intends starting up work again on its claim at Spring gulch, north of Yreka, having secured more capital to sink down to bedrock, it being necessary to keep a steam pump in constant operation on account of the great amount of water to contend with. On reaching bedrock, good prospects are found. A larger pump can be used to keep the water out, or it may be deemed advisable to run a bedrock tunnel to keep the claim drained continually. The McConnell & Quinn river claim on the Klamath, at mouth of Humbug, has been paying handsomely this season, and considerable dust has been realized. The superintendent, A. Smith, has managed to strike the old channel again, which has always proven rich. The R. H. Campbell Gold Mining Co. at Quartz valley continues to find very rich prospects, most of the gravel at bottom of the shafts on bedrock yielding as high as $10 to the pan, which means a vast amount of gold when the top is sluiced off in shallow places and drifted under its deepest points. The Spencer quartz mine on Humbug has been paying handsomely of late, notwithstanding reports to the contrary. Over 600 ounces have been realized in the last four cleanups, the last one for 11 days run of the five-stamp mill being 160 ounces. Other quartz mines on the creek have also been turning out very well this summer, and the indications show that Humbug is one of the best quartz-mining camps in Siskiyou.

NEVADA.

Washoe District.

CONS. CAL. & VIRGINIA.—*Chronicle*, Sept. 3: There has been extracted from all parts of the mine during the week 996 480-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $26.77 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $23.69 per ton per battery samples. Bullion now on hand in our assay office, assay value, about $24,800.

OPHIR.—1465 level: From the south drift, 101 feet below the sill floor of the 1465 level, at a point 42 feet in from its mouth, the west crosscut No. 2 has been advanced 17 feet; total length, 52 feet; in porphyry with little quartz.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift has been extended during the week 25 feet.

UTAH.—340 level: From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 23 feet; total length, 243 feet, continuing in porphyry and clay, showing some quartz.

SIERRA NEVADA.—On Cedar Hill, in what is known as the Steel drift, have been following a streak of quartz 4 to 6 feet wide which yields assays of from $15 to $40 in gold.

ANDES.—On 420 level, east crosscut No. 1, north, has been advanced during the week 15 feet; total length, 103 feet; formation porphyry.

GOULD & CURRY.—During the week we have extracted from the old stopes on the 200 and 400 levels 43 cars of ore; average car sample, $18.66 per ton. Sent to the Occidental mill 119 tons; crushed 105 tons; battery assay, $17.70.

BAST & BELCHER.—900 level: During the past week the north drift from east crosscut No. 1, 100 feet from switch, has been advanced 18 feet through soft porphyry, clay and stringers of quartz; total length, 120 feet.

HALE & NORCROSS.—1800 level—During the week advanced the north drift 20 feet; total length, 160 feet. During its progress some low-grade quartz has shown on the west side of this drift and it has cut some small bunches of good ore. Present formation in the face, porphyry. The south drift on this level was advanced 25 feet; total length, 145 feet; face of the drift in porphyry.

CHOLLAR.—Are repairing north drift, 750 level, and west drift, 550 level. East crosscut, 160 feet south of north line, 930 level, is in 38 feet; face in porphyry.

POTOSI.—The northwest drift from the 1800 station, Ward shaft, is out 790 feet; face in hard porphyry. Extracted and sent to the mill the last week, 224 800-2000 tons of ore from the 550, 930, 1100, 1150 and 1300 levels. Milled during the week, 257 tons. On hand at mill, 80 100-2000 tons; average battery assays, $24.83; average car sample assays, $24.79.

BULLION.—The upraise from the east crosscut, 320 feet south of north line, 1300 level, is up 37 feet; top in quartz. The northwest drift from the 1800 station of Ward shaft is in 790 feet; face in hard porphyry. The Potosi winze is down 486 feet below the 1500 level; bottom in quartz and porphyry.

WARD CONSOLIDATION SHAFT.—The joint Alpha and Exchequer south drift from the north line of Exchequer, 1800 level of Ward shaft, has a total length of 445 feet; face in hard porphyry. The joint Bullion and Potosi northwest drift from the 1800 station is out 790 feet; face in hard porphyry. Have started a joint west crosscut on south crosscut on south line of Exchequer.

ALPHA.—The joint Exchequer and Alpha south drift from north line of Exchequer, 1800 level of Ward shaft, has a total length of 445 feet; face in porphyry. Have started joint west crosscut on south line of Exchequer.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels have extracted and milled 175 tons of ore of the average assay value of $19.80 per ton as per battery samples. Have extended the main north drift, 750 level, 8 feet; total distance from winze station, 464 feet. The face of the drift is in low-grade quartz. The Zadig drift, Sutro tunnel level, has been advanced 20 feet; face in west country rock; total length of main drift, 614 feet; total length of cross drift, 211 feet.

EXCHEQUER.—The joint Exchequer and Alpha south drift from north line of the Exchequer, 1800 level of Ward shaft, has a total length of 445 feet; face in porphyry.

CON. NEW YORK.—The north drift from No. 3 crosscut, 650 level, is out 10 feet; face in quartz, west side showing fair-grade ore. Have started north and south drifts in the winze 50 feet below the 650 level; both show good ore. Car samples average $30 to $40.

SILVER HILL.—Are grading the northwest drift, 260 level.

El Dorado Canyon District.

NEW PLACERS.—Dayton *Times*, Sept. 1: For the past few weeks the new placer locations at the head of El Dorado canyon, about 20 miles from Dayton, have been the subject of a great deal of talk. Raycraft Bros. of Carson are the pioneers of the new mining region, and therefore have the best locations. The canyon is now located for a distance of five miles. The great difficulty to overcome is the want of water. All the lakes and springs in the neighborhood have been located, and ditches are now being dug to carry water to the claims. The ditch will be three or four miles long. With plenty of water, it is expected that $100 a day to the man can be made. As it is, those at work make wages. As high as $1 a pan is frequently taken out. The gold is coarse. One nugget has been taken out that was worth $20 and another one worth $12. The mines can be worked only about six months in the year, and the snow makes all operations in the winter impossible. The placer ground is all the way from five to six feet deep to bedrock and pays all the way.

Kennedy District.

A PROMISING CAMP.—Cor. Austin *Advocate*, Sept. 1: The Imperial lode, no doubt, is the best in the State. It will average three feet in width and can be traced 6000 feet. The Imperial mine on this lode is a good one. The ore will average $40 in gold and from 20 to 40 ounces in silver. It is owned by Kennedy, Benton & Co. There is a tunnel run on the ledge 150 feet, in good ore all the way. There are about 250 tons of ore on the dump. Next north on the lode are the Kersarge and Wiggin mines, owned by Stone & Wiggin. They have run a cross tunnel 100 feet and struck a three-foot ledge of ore. They have about 50 tons of good milling ore on the dump. South of the Imperial is the Chipmunk mine, owned by Joseph Miller. There is a tunnel 80 feet on the ledge which shows good ore. West of the Imperial are the Alta and Alice mines, which show very rich ore. There is not much work done on them yet, but there is some very high-grade ore on the surface. These mines are also owned by Stone & Wiggin. Southwest of those mines is a very promising mine owned by Mrs. Huntsman, of Battle Mountain, and Mr. Hurley. Kyle & Hillyer have a good mine. Jake Leick has a good prospect, the Cricket, east of the Imperial about one-quarter mile. There is a tunnel in on the ledge 100 feet, in good milling ore all the way. North of the Cricket is a mine owned by Dan Keeler and M. Towle. There is a 70-feet tunnel on the ledge, showing good ore. South of the Cricket is a big prospect of very good ore owned by Bent. Larsen, Northway and Lamberson have some good prospects. There are several other very fine prospects in the district, and it offers the best chance for capital to invest that I ever saw in the State. We need a mill to reduce our ore, but we are all too poor to build one. As soon as capital takes hold of some of these mines, this will be the best camp in the State. There is gold enough in any of the ore to pay well for milling; besides, one-half of the value of the ore is silver. Kennedy & Benton are running an 18-feet arrastre and taking out lots of the yellow dust. If men that are mining men and have money will come and take a look at and sample our mines, we shall have a lively camp in a few months.

Tuscarora District.

NAVAJO.—*Times-Review*, Sept. 3: The stopes above the 350-foot level are yielding as usual. The pump has been moved to the 350-foot level.

BELLA ISLE.—South drift, 250-foot level, extended six feet; the vein is looking better. Upraise from the gangway drift, same level, extended three feet; rock very hard and the ore lower grade than at last report.

NORTH BELLE ISLE.—A drift has been started

north on the ore cnt in the line crosscnt, 300-foot level; the pay streak is smsll bnt high grade, progress four feet. The upraise from the south 500 stopes has been extended 15 feet and connected with the 400-foot level, and these stopes will now be worked from the 400 foot level.

NEVADA QUEEN.—Face of east line drift advanced ten feet; stopes show about the same at this point as last reported. Winze stopes continue the usual production. Hoisted during the week 39 cars of first-class ore, sverage csr ssmple assay $175 per ton, and 169.2 tons of second-clsss, sversge sssay, $23.59 per ton.

COMMONWEALTH.—Esst line drift extended ten feet, exposing a small streak of first-class and two feet of second-class ore, which is being stoped. East intermediate drift from chute No. 3 exposed some high-grade ore, progress 16 feet. Third level stopes continue abont the same. Hoisted fonr cars first-clsss ore during the week, average assay $200 per ton, and 108 tons concentrating ore, average assay $22.79 per ton.

NORTH COMMONWEALTH.—Hoisted eight cars second-class ore, average assay $102 per ton, and one car first-class.

IDAHO.

THE VIENNA MILL.—Wood River *Times*, Sept. 3: The Vienna Company's mill is to be started up on Solace ore, but it will not make much of a run—not over three or four months—unless better prices are obtainable for silver, as the mine cannot be made to pay at present figures.

NEW MEXICO.

MILLINO —Silver City *Sentinel*, Aug. 30: The Brockman mill, at Lone Mountain, started up last week and is now treating from 25 to 30 tons of ore a day with 10 stamps running. There is a laige amonnt of ore, all of which can be milled at a good profit. There is a scarcity of water at the Mountain Key mill, and only a part of the stamps are now running. It is feared that the Pacific Gold Co. will have to suspend operations. There is a prospect that the affairs of the Last Chance Co. at Silver Creek will be straightened ont, and that the mill will be started up again soon. There is an immense body of low-grade ore in the mine which can be mined and milled at small cost. There is practically nothing doing at Hanover. The situation remains the same ss when the Atchison, Topeka & Santa Fe Rsilroad Co. refused to furnish any more csrs to the Silver City and Northern abont six weeks ago; but proceedings have been commenced which may result in the restoration of the throngh rates, when, in all probability, the shipment of ore from the camp will be resumed. The Mimbres Consolidated mill has been closed down in order to make some needed repairs, and ore is accnmulating at the mine. A great deal of work will be done at Black Hawk in the next few months. The number of men employed there has been increased considerably, and there is a good prospect that the camp will resume its old-time aspect before many months. The mines there have produced as rich silver ore as was ever taken out in the Territory, and they have not been worked out by any means. While the low price of silver is discouraging to silver miners, snch ore as is produced by the mines at Black Hawk could be mined and shipped profitably with silver even lower than it is now. The lixiviation plant, which is now being operated by P. B. Smith at Stein's Pass, has been doing satisfactory work for over two months. The low-grade ores from the Volcano mine, which have been accumulating for several years on the dump, will all be treated by this process, and there are other mines in the camp which could be worked to good advantage if there were facilities for working the ore by this process. The plant which is now in operation is small, but a larger one will be put up, when it is expected that the production of the camp will be considerably increased.

OREGON.

GRENHORN DISTRICT.—*Bedrock Democrat*, Aug. 30: Just prior to departing from Austin's, on the Middle Fork of the John Day, a few days since, it was the pleasnre of a *Democrat* representative to converse for a few moments with Mr. Taylor Althouse, one of the prominent mine-owners of the Greenhorn district. In speaking of the camp, Mr. Althouse stated that the wildcat schemers with whom that district was formerly afflicted were now conspicuous only by their absence, much to the gratification of those practicing legitimate mining. He informed the reporter that mine-owners were pushing development on their properties with good results. The old ledges improve as depth is attained, and to-day in this district are to be fonnd many well-developed properties, presenting msgnificent showings. Numerous new properties are also receiving attention which give promise of developing into first-class properties.

CONCENTRATES TO TACOMA.—Manager Robbins, of the Robbins-Elkhorn mine, was in the city yesterday, and when asked concerning operations at the mine, said that the *Democrat* might inform its readers that a four-horse wagonload of concentrates was hauled daily from the mine to this city for shipment to the Tacoma Smelting Works at Tacoma, Washington.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

Market Reports.

Local Markets.

SAN FRANCISCO, Sept. 7, 1892.

General trade was interrupted by a holiday on Monday, and as there is another on Friday business will not resume its normal condition until next week, and even then, it is thougbt, buying will be slow owing to the State Fair attraction. It is claimed that the different district fairs have been better attended this year than for years past; this being the case, accounts to a certain extent for slack trade. Traveling salesmen report the prospects all that can be desired for a prosperous fall trade. They claim that retail merchants are carrying small stocks, and that when consumers buy the bulk of their winter requirements heavy purchases will be in order. Iron workers and manufacturers in general report a fair degree of activity, with some firms reporting orders ahead.

The local money market is reported essentially unchanged. The banks report a large reserve, for the season, on hand, while the demand, outside of advances on grain, is of a negative character. There are liberal disbursements in this and adjoining cities for improvements. While there is an absence of a spirit of speculation, yet there is more substantial improvements going on than even the better informed are aware of. These improvements call for heavy disbursements and keep large forces of men at work. In this city, it is claimed, that, outside of seafaring men, there are fewer idle men than ever before known. This speaks well for San Francisco. Those in positon to know claim that throughout the State very few idle men are to be found, and those found are idle more form choice than lack of work. Of course the fruit and grain harvests give employment to thousands of bands, but outside of these industries more men are claimed to be at work. The outlines for railroad construction in 1893 warrants the assertion that we will probably have more active times in next year than witnessed in the present year.

Eastern mail advices report a strong money market, with the rates of interest stiffening. Bankers that had out Call loans at two per cent have advised borrowers that 2½ per cent would be demanded. The advance was complied with. The stronger money market is said to be largely due to the calls from the central and southern States for crop purposes. While this may be the case, yet to the cholera scare much can be traced. It is but natural, when threatened with an epidemic, for the public to make preparations financially for the worst, and it does not take much money to be withdrawn by each person to make a large aggregate. Writing on the present condition and outlook, Woerishoffer & Co, of New York say: "No one can, of course, say what calamity may be in store for us in the form of disease or disaster, but, barring calamities against which human foresight is helpless, we see nothing but prosperity ahead of us. We prefer basing calculations on the chances of life and prosperity rather than on death and adversity." The above shows that the drift of opinion is in line with ours. The New York *Daily Stockholder* estimates the interest and dividend disbursements in that city during the present month at $25,000,000.

SILVER—There was exported in bullion by sea, in the past week, $110000 to Hong Kong and $69,000 to Japan. The market at home and abroad has held to fairly steady prices. The steadiness of the markets causes fear that the manipulators are planning for another break, yet possibly it may be due to the cholera scare preventing their carrying out the speculative manipulation which was programmed at the time the syndicate was organized. The low prices ruling for silver have caused many mines to close down, which, unless a recovery in prices sets in soon, will be followed by the closing down of other mines. The monthly purchases of silver by the United States are said to be greater than we produce.

MEXICAN DOLLARS—The shipments by sea the past week aggregate $340,271 to Hong Kong. The market is fairly steady at 67½@67¾ cts.

QUICKSILVER—Receipts the past week aggregate 444 flasks; 100 of the flasks were shipped back from Australia so as to get the difference between the export and home prices. The venture netted a nice profit. The market is weak. The exports by sea aggregate the past week 412 flasks to Mexico.

AMTIMONY—The market is weak and lower in sympatby with New York. The latter market was at last mail advices quoted as follows: 10¾c for Hallett's, 11¼@11½c for X. L., 11¾c for Crown, and 12¼@12½c for Cookson's.

LIME.—Receipts the past week aggregate 3,709 bbls. The market is reported fairly steady at $1.25 and $1.50 per bbl.

BORAX.—Receipts the past week aggregate 440 ctls, and exports by sail to New York 2020 ctls., and by steam *via*. Panama 1652 ctls. The market is fairly steady.

PIG LEAD.—There was shipped the past week to New Yotk 211,540 lbs. The market is steadier, the low freigbts to New York being in favor of sellers. The eastern markets are stronger with a free trade call reported.

COPPER—There was shipped by sea to New York the past week 121,766 lbs. copper matte. The market is irregularly weak. *Iron Age* reports to the New York market as follows: "Home consumers buy with no greater freedom, at all events, nor do export purchasers compensate in any noticeable degree for the slackness of bome buying. Production meanwbile continues on a liberal scale. Prices for Lake Superior ingot stand practically the same as they were a week ago, with 11¾c the popular quotation, but 11¾c to 11.65c a more correct representation of the basis at which the moderate business passing is effected. Electrolytic is generally quoted at 11c, but sells at as low as 10⅞c. For common casting brands 10½c is the general quotation, but some business is understood to have been done at a shade less."

TIN—Imports the past week aggregate 1607 ingots from Sydney. The market for hotb plate and pig is in buyers' favor. The Englisb market is cabled for pig irregular, with stocks kept within manageable proportions. New York mail advices report an inactive market.

PIG IRON—The market is essentially unchanged. English cablegrams report a further reduction in stocks, with a 2s advance for certain brands. New York mail advices report as follows: "A more satisfactory feeling is developing in Philadelphia, cheap lots growing scarcer, but Chicago shows a weakening though more active market, while Cincinnati and Louisville are dull. Pittsburg reports sales of Bessemer pig aggregating about 20,000 tons for forward delivery at $13.85 Pittsburg and $13.75 Wheeling."

COAL—Imports aggregate as follows: Seattle, 1470 tons; Baltimore, 2565; Nanaimo, 6203; Coos Bay, 800; Sydney, 5098; Newcastle, N. S. W., 3669. Total, 19 805 tons. The market for spot on passage and to arrive is essentially unchanged. The general feeling is that the market ought to rule higher, but it does not, which shows that sentiment is one thing but facts are another. It looks as if more consumers had prepared against an advance than the trade was led to believe. The list of ships on the way from, loading and to load at Newcastle, N. S. W., and also at Sydney, is lengthening, which is accepted as proof positive that unless we have an exceptional hard winter no higber prices need be expected this side of Christmas.

Mining Share Market.

SAN FRANCISCO, Sept. 7, 1892.

The market for Comstock shares has been irregularly active with a downward tendency. The senior member of one of the largest commission broker firms, says, that during the late activity, and when prices were the highest, his firm purchased several thousand shares of the leading mines on the Comstock for persons who paid cash and took the shares away. The purchases ranged from 100 to 400 shares each. We are informed that other brokers also made liberal purchases for outsiders. This, then, accounts for the lower and less active market the past week. The rings have evidently succeeded in entrapping a large number of assessment-paying operators. If they can only get a sufficient amount of shares out on the public, assessments and mine-looting are good enough. It is now a well-recognized fact that the movements of the mill rings and stock pools, are closely watched and for that reason more care is exercised how bullion is secured. It looks as if the rings are doing all in their power to wear out the patience of those who are on the lookout for mine-looting and other equally as nefarious acts, and when they succeed in tiring them out then the old game will begin, of misappropriating bullion and other various ways of enriching themselves at the expense of shareholders. It is a great game, this of working the Comstock mines.

Two assessments were levied the past week. Others are to follow soon. There are persons in position to know who claim that each mining company on the Comstock will levy and collect from two to five assessments within the next nine or ten months. Of course this is contingent on the success the rings have in peddling out shares and keeping assessment payers in the trap.

Some time ago it was given out that the Con. Virginia Co. would bave to levy one or more assessments, but few gave credence to the reports. The returns for the month of August indicate that the company is in debt.

The pay roll at Virginia of the Comstock mining company aggregated in August $143,840, an increase of $6407 over that of July. It is claimed that some of the companies report larger disbursements than are made, or if made, they are to persons not employed, and who probably divide the ill-gotten money. There are many tricks by which the money can be made, none of which appear to be missed by the rings. To deal in the Comstock shares with the mines managed as they now are, is like fooling with bot irons—no one can expect to escape being burnt.

The Silver King Mining Company, Arizona, is crushing rich ore. There are those who claim that dividends are likely to be paid in the near future. The only thing in the way to the paying of dividends is that the mine is said to be controlled by some of the members of the Comstock mill rings. The same stumbling block, it is said, is in the way of the Bodie mines being successfully worked. Of course 10 cent, or even 25 cent dividends may be paid for a short time by one of the companies in each district, but the only significance that would attach to the dividends would be a desire to peddle out shares in the different mines for assessing.

News from the Comstock mines is said to be confirmatory of dead or unimportant work. This is the outcome of the persistency of the Mining Stock Association in keeping close watch on the mills, ore sent to the mills, the bullion produced, and what becomes of the concentrates, tailings, etc. Evidently the rings are determined not to have any important developing work done, at least for the present; and it is probably as well they have come to this determination, for all outsiders have been getting for over a decade past out of any ore developed has been assessments, while the rings got the bullion. Of course part of the bullion produced at one time by the Con. Virginia Mining Company went to shareholders, but as dividends were paid the market value of the shares went down, carrying the price of all others with it. The dividends attracted outside buyers, who got the shares at bigh prices, and the rings got the cash, and, as usual, the former are out financially. Of course, there is no ore now to be found for outsiders in the mine, and probably never will be. When the shares are bougbt back at low prices, through assessments or otherwise, then rich ore will be accidentally, as it always is, found, the shares peddled out, and the old game successfully played. It is a great game, this of working the Comstock mines. The public is being treated to reports of finds, improvements, etc., in Sierra Nevada. In July this paper outlined the probable result of the work in the mine, and so far it has proven correct. The Pumping Association is not so free with information regarding the progress of the work looking to pumping out of the Gold Hill mines. There are those who contend that it will be a long time yet, with many assessments to be paid, before the mines are pumped out.

The market opened dull but firm this morning. After regular call there were crossorders for the purpose of supporting the market. Toward the noon hour prices were a shade higher. It looks at this writing, as if the rings will advance the market slightly; some claim that this will be done to keep those who have bought from selling and also get others to buy.

Mr. Tingman, secretary of the Mining Stock Association, called on Mr. Fisb, president of the Con. Virginia Mining Co., this morning for information as to whom the three stray bars of bullion belong, and what right one of the milling company had to them. Like dummy officials, Mr. Fish did not know anything, and had not made a move to find out. Mr. Tingman called on the lawyer for the company regarding the stray bullion. He promised to have a meeting of the directors of the Con. Virginia called, so as to have the subject examined into. It looks as if the mill company will not only have to give up the bars of bullion but force other developments. Why do not the mining companies conform to the laws under which they incorporated? If the law was conformed to, then, it is claimed bullion would not go astray and mine-looting would be of the past.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13½	English, lb	— @ 18
BORAX.		Canton tool	— @ 8½
Refined, in car lots	— @ 7½	Sl'k Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	8½ @ 10
Concentrat'd, do	— @ 6½	Machinery	4 @ 5
All grades jobbing at advance.		Ice Calk	— @ 4½
COPPER.		**TINPLATE**	
Bolt	22 @ —	S. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 5 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @11 75
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot ℔ lb	— @ 23
Norway, base	— @ 4½	**COAL.**	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton ℔ ton	22 00@—	Wellington	$8 00
Glengarnock	23 00@—	Gretta	6 75
Am. Soft, No. 1	24 00@—	Nanaimo	7 00
Oregon Pig	—@—	Gilman	6 00
Puget Sound	—@—	Seattle	6 50
Clay Lane White	24 00@—	Coos Bay	5 50
Langloan	22 00@—	Cannel	8 50
Thorncliffe	23 00@—	Egg bard	11 50
Gartsberrie	22 00@—	Cumberland, in sacks	14 00
Barrow	22 00@—	Do, bulk	13 00
Carnoffect	22 00@—	Wallsend	7 00
CHROME IRON ORE.		Brymbo	6 75
Per ton	t0 00 @—	West Hartley	7 50
LEAD.		TO LOAD—PER TON.	
Pig	— @ 4½	Australian	5 75@—
Bar	— @ 6½	Liverpool Steam	6 00@—
Sheet	— @ 7	Scotch Splint	6 00@—
Pipe	— @ 6½	Cardiff	6 25@—
SHOT.		**COKE.**	
Drop, sizes *smaller* than B, ℔ bag of 25 lbs	$ 85	Lehigh Lump	12 00@—
Do do, B and *larger* sizes ℔ bag of 25 lbs	2 10	Cumberland	9 00@—
QUICKSILVER.		Egg, bard	10 00@—
Home trade, pr. flask	41 50 @42 00	West Hartley	6 50@—
For export	35 50 @36 00	English, to load	$8 00@ 9 00
		Do, spot, in bulk	—@10 00
		Do, in sacks	—@12 00
		Cumberland	9 00@—

Eastern Metal Markets.

NEW YORK, Sept. 7.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38½	83½	11 40	4 15	20 30
Friday	38½	83½	11 40	4 15	20 30
Saturday	38½	83½	11 40	4 15	20 30
Monday					
Tuesday	38½	83½	11 40	4 15	20 30
Wednesday	38½	83½	11 40	4 15	20 30

Quicksilver is irregular and easy. Borax is in heavy supply, but it is not being forced on the market. Pig Iron is unchanged. Tin is barely steady. Copper is unfavorably influenced by cholera in Europe.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

HEGOLA MILL AND MINING CO. Location, Mokelumne Hill, Calaveras Co. Capital stock, $100,000. Directors—Joseph Davis, H. J. Brand, Mary Davis, E. J. Elgy and Charlotte Davis.

SAN FRANCISCO AUTOGRAPHIC REGISTER CO. Capital stock, $100,000. Object, dealing in an automatic register machine for making and storing facsimiles of writings, impressions, indentations, cuttings, punchings, etc. Directors—F. A. Osborn, C. G. Young, Prentiss Selby, M. M. Stern, J. K. Wilson, J. T. Rucker, A. C. Rulofson, I. P. Allen, F. S. Chadbourne, J. J. McManus, Frank J. Stone, Nathaniel Hunter, George F. Eberhard, E. F. Osborn and W. M. Cubery.

NOLAN DRAYAGE AND WAREHOUSE COMPANY. Directors—W. H. Nolan, William Green, C. H. Kohn, W. E. Folley and Frank Sweeney.

PNEUMATIC POWER COMPANY. Directors—Charles Cummings, J. W. Stewart, W. S. Bell, G. L. Brown and William Johnstone.

MAGNOLIA M. AND M. CO., Boulder county, Colo. Capital stock, $1,000,000. Directors—W. D. Patty, John E. Norling, J. A. Nye, J. A. Tengarden, W. R. Hanze, P. O. Norling and J. J. Johnson.

ATLANTIC MINING AND MILLING CO. To operate mines in Kootenai county, Idaho. Directors—G. O. Morrell, of Pullman, Wash., and H. A. Slade, E. D. Faust, E. M. Gillette, Thomas Martin and L. H. Faust, of Kootenai, Idaho. Capital stock, $1,000,000.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING AUG. 30, 1892.

481,511.—ICE PITCHER—R. Arnold, Sacramento, Cal.

481 838.—IMPREGNATING LIQUIDS WITH GASES—U. Bachmann, Mission San Jose, Cal.

481,811.—BEANTHRASHER—P. Bourgin, Oakland, Cal.

481,612.—TOILET-PAPER HOLDER—M. A. Brown, Seattle, Wash.

481,845.—LAUNDRY DRYING-ROOM—J. E. Chappell, S. F.

481,847.—FIRE ALARM TELEGRAPH—A. J. Coffee, Portland, Or.

481,893.—CAN-LABELING MACHINE—P. Crittenden, S. F.

481,849.—FIRE ESCAPE—A. B. Cruickshank, S. F.

481,850.—AIR COMPRESSOR—M. Dillenburg, S. F.

481,555.—DRAG-SAWING MACHINE—L. Forsman, Athina, Or.

481,864.—THRASHING CYLINDER—Sam'l Hamilton, King City, Cal.

481,793.—CALENDAR CLOCK—Johnson & Hamill, Globe, A. T.

401,907.—CAR-COUPLING—J. Kindleberger, San Diego, Cal.

481,703.—REVERBERATING FURNACE—H. Mathey, South Riverside, Cal.

481,768.—LAMP STOVE—J. F. Meyers, S. F.

481,823.—SAW-FILING MACHINE—J. Richardson, S. F.

481,831.—AIR SUPPLY FOR BOILER FURNACES—I. V. Scholfield, Jr., S. F.

481,834.—SAFETY PIN—A. T. Snell, Ventura, Cal.

481,657.—GAME COUNTER—Sturgis & Peck, Presidio, Cal.

481,836.—SAWTOOTH—J. W. Todd, Portland, Or.

481,708.—PLOW—E. L. Ward, Santa Rosa, Cal.

The following brief list by telegraph, for Sept. 6, will appear more complete on receipt of mail advices:

California—John Buckley, Eureka, cable-logging machine; John E. Daley, Glendora, and A. A. Neil, Covina, orchard cultivator; George Gates, Jackson, separating sand and slimes; Frederick C. J. Grebe, Los Angeles, historical toy novelty; Leonidas Guillemet, San Francisco, slack take-up for brakes; Chas. F. Heath, Durham, saw-set and gauge; James McDonald, Los Angeles, water circulator and purifier for steam boilers; Alexander J. McAdam, San Francisco, elevator controlling mechanism; John D. D. Mortimer, Stockton, shipping receipt book; Frank C. Phillips, Healdsburg, fruit-pitting machine; Edward E. Thomas, San Jose, fruit dipper; Judge D. Thomas and E. E. Thomas, San Jose, fruit-pitting and spreading machine; Cornelius Toohey, San Francisco, grocer's caddy.

Oregon—Geo. W. North, Clarke's, clothes-drier; Abram C. Speer, Woodville, portable hand-sawing machine; George Williams and A. A. Cleveland, Astoria, pound net; Sanford R. Williams, Monmouth, car coupling.

Washington—Geo. C. Harlin, Seattle, car coupling; Balston C. Kenway, Tacoma, construction of seawalls; Geo. A. Kimball, Seattle, automatic trolley disconnector.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HYDRAULIC LIFTING DOCK.—Robert Morau, Seattle. No. 481,411. Dated Aug. 23, 1892. The object of this invention is to provide a simple and economical device for lifting vessels out of the water and for other similar purposes. This device may be used also as a transfer device to raise vessels, which are afterward transferred bodily from the dock to a wharf or other position, and it may also be used in connection with locks to transfer vessels from one water-level to another.

BEANTHRASHER.—Pierre Bourgin, Oakland. No. 481,841. Dated Aug 30, 1892. This machine may be drawn over the floor upon which the vines carrying the bean-pods are spread, and caused to traverse it from side to side until the thrashing is complete. Flexible arms, constructed in a peculiar manner, serve not only as heaters hut as forks or stirrers to lift the vines, so that when the machine again passes over them, new surfaces will he presented to the flails.

SAW-FILING AND SETTING MACHINE.—John Richardson, S. F. No. 481,823. Dated Aug. 30, 1892. This machine for sharpening and swaging sawteeth consists in the novel mechanism for effecting the adjustment or feed of the saw, to present successive teeth to the action of the sharpening tool, and finally in the novel mechanism for operating the swaging-hammer.

IMPREGNATING LIQUIDS WITH GASES.—Ulrich Bachmann, Mission San Jose. No. 481,838. Dated Aug. 30, 1892. This especially refers to the class of apparatus for automatically charging liquids with carbonic acid gas. The invention consists in charging and confining within the liquid receiving vessel or vessels a given supply of carbonic acid gas under pressure, charging the liquid-reservoir with a given pressure of gas, and feeding the liquid from the reservoir to the receiving vessels by allowing it to flow therein, whereby it displaces the gas in said vessels, increasing its pressure therein and checking automatically the continued flow of the liquid until a portion of the gas is absorbed, and the pressure thereby reduced sufficiently to again permit the flow, and so on until the liquid has all passed to the receiving vessels and the gas therein is completely absorbed by the liquid. The object of the invention is to provide a simple and effective method and means for thoroughly and automatically charging liquid with carbonic acid gas.

THRASHING CYLINDER.—Samuel Hamilton, King City, Monterey Co. No. 481,864. Dated Aug. 30, 1892. In the ordinary construction of thrashing machine cylinders, circular disks or spiders are fixed transversely to a central rotary shaft having bars around the periphery parallel with the shaft, and teeth are fixed in these bars at intervals by screw-threaded shanks at their inner ends, which pass through the holes in the bars and are secured by nuts on the inside. This construction is necessary because the outer ends of the teeth are made wedge-shaped in order to give them sufficient strength in the line of motion to resist the strain brought upon them by the straw and grain passing between the teeth of the cylinder and those of the corresponding concave at a high speed, and on account of this construction of the teeth must be put in from the outside. In Mr. Hamilton's invention he makes the teeth wedge-shape in transverse sections, tapering from the outer face of the cylinder bars to the point, with the front and rear edges parallel and forms a head upon the inner head of each tooth. Slots are made in the cylinder bars which are so shaped as to receive these teeth, which are introduced from the inside, and the centrifugal force of the cylinder when in rotation draws the teeth firmly into place with the heads against the inner sides of the bars and prevents their falling out. In the ordinary construction the weakest point of the teeth is at the junction of the teeth with the bar. In the improved construction, the strongest portion of the tooth is that portion in the bar and just outside of it. There are no screw-threads or nuts, and all the teeth in the cylinder may be slipped into their respective bars with the figers and if the heads do not exactly set at first they will be drawn into place by centrifugal force as soon as the cylinder is set into revolution. In order to remove them it is only necessary to tap them with a hammer outside, when they can be easily removed.

AIR-SUPPLY FOR BOILER FURNACES.—Ira V. Scholfield, Jr., S. F. No. 481,831. Dated Aug. 30, 1892. This device for supplying air to boiler-furnaces consists in a chamber surrounding the upper part of the furnace, with doors and openings through which air is admitted into the chamber, where it is heated from the furnace and is directed around the sides of the fire-door into the ash-pit below the grate-bars, from which it passes into the fuel space.

FIRE-ESCAPE.—A. B. Cruickshank, S. F. No. 481,849. Dated Aug. 30, 1892. This patent covers a fire-escape consisting of parallel vertical shafts, cages moving therein and connected with a single rope passing over guide-pulleys, an automatically-operating governor and brake and supplemental checks, whereby the speed of the downwardly-moving cage is regulated and checked and an elastic or spring platform at the bottom on which the cage is received.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2, Oct 6, Oct 27		C E Elliott, 3 9 Montgomery
Belle Isle M Co, Nevada	1	10c	Aug 22, Sept 23, Oct 20		J W Pew, 310 Pine
Best & Belcher M Co, Nevada	62	25c	Aug 17, Sept 22, Oct 13		L Osborn, 309 Montgomery
Bullion M Co, Nevada	31	25c	Aug 11, Sept 16, Oct 4		R R Grayson, 331 Pine
California Verde Antique Marble Co, Cal	2	1c	July 12, Aug 23 Sept 12		W J Gurnett, 308 Pine
Challenge Cons M Co, Nevada	12	10c	Aug 24, Sept 27, Oct 18		C L McCoy 331 Pine
Confidence M Co, Nevada	21	50c	Aug 15, Sept 15, Oct 5		A S Groth, 414 California
Crocker M Co, Arizona	12	5c	Aug 11, Sept 20, Oct 18		A Waterman, 309 Montgomery
Crossbow M Co, California	1	10c	Aug 4, Sept 12, Oct 3		H D Walker, 309 Montgomery
Del Monte M Co, Nevada	6	10c	July 26, Sept 5, Oct 5		J W Pew, 310 Pine
Evening Star M Co, California	5	1c	Aug 19, Sept 21, Oct 8		J J Scoville 320 Sansome
Exchequer M Co, Nevada	33	10c	July 27, Aug 31, Sept 20		C E Elliott, 309 Montgomery
Florida Hill M Co, Idaho	4	3c	July 29, Sept 2, Sept 28		R R Grayson, 331 Pine
Gold Mt M Co, California	3	2c	July 16 Aug 20, Sept 8		J F Curtis, 325 Montgomery
Golden Fleece Gravel M Co, California	17	5c	July 16, Aug 24, Sept 30		W J Gleason, Phelan Block
Gover M Co, California	3	10c	July 28, Sept 1, Sept 28		R McF Doble, 15 Fremont
Guascaran & California M Co, Honduras	7	$1.50	Aug 9, Sept 15, Oct 8		E Oliver, 22 Mint Avenue
Hale & Norcross M Co, Nevada	104	50c	Aug 11, Sept 15, Oct 7		A B Thompson, 309 Montgomery
Independence M Co, Nevada	17	5c	Aug 15, Sept 19, Oct 13		J W Pew, 310 Pine
Justice M Co, Nevada	51	40c	July 26, Aug 31, Sept 19		R Kelly, 419 California
Keystone Con M Co, California	3	$1	Aug 22, Sept 26, Oct 18		J H Isham, 310 Pine
Mountain Tunnel M Co, California	5	7c	July 28, Aug 27, Sept 26		E C Lander, 219 Sansome
Navajo M Co, Nevada	22	10c	Aug 17, Sept 21, Oct 14		J W Pew, 310 Pine
Northwestern G M Co, British Columbia	5	20c	Aug 17, Sept 25, Oct 15		Bonacina, 438 California
Peer M Co, Arizona	13	10c	July 19 Sept 8, Oct 6		A Waterman, 309 Montgomery
Peerless M Co, Arizona	18	10c	July 8, Sept 1, Sept 20		A Waterman, 309 Montgomery
Scorpion M Co, Nevada	28	5c	July 11, Aug 14, Sept 12		G R Spinney, 310 Pine
Silver Hill M Co, Nevada	31	5c	Aug 2, Sept 5, Sept 27		D C Bates, 309 Montgomery
Silver King M Co, Arizona	9	25c	Aug 26, Oct 7, Nov 4		J W Pew, 3 9 Pine
Teresa M Co, Mexico	8	10c	Aug 19, Sept 22, Oct 8		K J Willats, 809 Market
Union Cons M Co, Nevada	46	20c	July 13, Aug 24, Sept 13		A W Barrows, 303 California
Western Star M Co, California	1	2c	July 25, Aug 30, Sept 21		J A Reed, 328 Montgomery
Yellow Jacket M Co, Nevada	52	25c	Sept 5, Oct 7, Nov 11		W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
El Dorado Slate Co, California	Annual	R M Welch, 3 3 California	Sept 9
Grand Prize M Co, Nevada	Annual	R R Grayson, 331 Pine	Sept 20
Gray Eagle M Co	Annual	A W Barrows, 303 Cal	Sept 21
Mono G M Co, California	Annual	H D Walker, 309 Montgomery	Sept 15
Pacific Coast Borax Co, California	Annual	A H Clough, 101 Sansome	Sept 19

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 3 9 Montgomery	April 28
Champion M Co, California	15	T Wetzell, 310 Pine	Aug 18
Con Cal & Virginia M Co, Nevada	65	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	S pt 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 17.		WEEK ENDING Aug 24.		WEEK ENDING Aug. 31.		WEEK ENDING Sept. 7.	
Alpha	.15	....	.15	.15	.15	....	.15	....
Alta	.25	....	.25	.20	.20	.30	.25	....
Andes	.30	.35	.30	.25	.30	.40	.35	.40
Belcher	.80	.90	.45	.35	.90	1.45	1.00	1.20
Belle Isle	.10	....	.05	....	.10	....	....	....
Best & Belcher	1.30	1.40	1.30	1.05	1.10	1.40	1.20	1.40
Bullion	.20	.25	.25	.10	.15	.25	.20	.25
Bodie Con	.25	.30	.25	....	.30	....	.30	.50
Bulwer	.30	....	.30	....	.25	....	....	....
Commonwealth	.10	....	.10	....	.05	....	....	....
Con. Va. & Cal	3.20	3.45	3.30	3.00	3.15	3.40	3.20	3.35
Challenge	.25	.30	.25	.20	.20	.35	.25	.30
Chollar	.50	.60	.50	.40	.40	.50	.50	.50
Confidence	....	....	....	....	.90	1.35	1.00	1.20
Con. Imperial	....	....	....	....	.05	....	.05	....
Caledonia	.15	....	.15	....	.15	.25	.20	....
Crown Point	.10	.5	.55	.40	.45	.60	.50	.55
Crocker	....	....	....	....	.05	....	....	....
Del Monte	....	....	.05	....	....	....	.05	....
Eureka Con	....	....	2.00	....	....	....	....	....
Exchequer	.05	....	.05	....	.05	*15	.05	....
Grand Prize	.05	....	....	....	....	....	....	....
Gould & Curry	.85	.95	.85	.55	.55	.95	.80	1.05
Hale & Norcross	.75	1.00	.75	.45	.55	1.25	.85	1.00
Julia	....	....	.05	....	....	....	.05	....
Justice	.05	....	.05	....	.05	.20	.15	....
Kentuck	.05	....	....	....	.15	....	.10	.15
Lady Wash	....	....	....	....	....	....	....	....
Mono	.15	....	....	....	.15	....	.10	.15
Mexican	1.20	1.30	1.20	1.15	1.05	1.40	1.20	1.35
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	....	....	.05	....	.05	....	....	....
New Queen	.20	....	....	....	.15	....	....	....
Occidental	.40	.45	.40	.30	.30	.40	.30	....
Ophir	2.15	2.40	2.15	2.00	2.05	2.45	2.20	2.35
Overman	.25	.30	.30	.25	.30	.45	.35	.40
Potosi	.45	.55	.45	.35	.40	.55	.55	.50
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	.10	....	....	....
Savage	.55	.90	.70	.55	.60	.90	.70	.85
Sav. & M	.20	....	.15	....	.20	.30	.25	....
Sierra Nevada	1.05	1.30	1.05	.90	.90	1.60	1.35	1.55
Silver Hill	....	....	....	....	.05	....	.05	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	.75	1.00	1.05	.75	.85	1.30	1.20	1.35
Utah	.20	.25	.20	.15	.25	.30	.25	....
Yellow Jacket	.50	.65	.50	.40	.45	.75	.50	.65

*Assessment added.

Assessment Notices.

NOTICE OF ASSESSMENT.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Amador City, Amador County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of August, 1892, an assessment, (No. 3) of One Dollar ($1) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room 43, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 18th day of October, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. H. ISHAM, Secretary.

Office—No. 310 Pine Street, Room 43, San Francisco, California.

ANNUAL MEETING.

The Regular Annual Meeting of the Stockholders of the Pacific Coast Borax Company will be held at the office of the Company, Room 26, No. 101 Sansome St., San Francisco, Cal., on Monday, the 19th day of September, 1892, at the hour of 1:30 o'clock, P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting.

ALTON H. CLOUGH, Secretary.

DELINQUENT SALE NOTICE.

GOVER MINING COMPANY,

San Francisco.

Notice—There is delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 28th day of July, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Cert.	No. Shares.	Amt.
S N Maxcy, Trustee	112	150	$15 00
R T Hayes	54	37	3 70
O M Bancbard	55	37	3 70
T Frank Jones	59	200	20 00
T Frank Joces	80	200	20 00
T Frank Jones	245	600	60 00
T Frank Jones	252	125	12 50
R S Maxcy	71	1000	100 00
R S Maxcy	72	1000	100 00
R S Maxcy	73	1000	100 00
R S Maxcy	74	950	95 00
E C Wood	62	300	30 00
E C Wood	111	475	47 50
Adelaide Loring	77	825	82 50
L A Wade	78	600	60 00
L A Wade	153	200	20 00
L A Wade	152	500	50 00
John F Marr	92	10	1 00
John F Marr	288	40	4 00
Sylvester Marr	93	500	50 00
Sylvester F Marr	299	500	50 00
O G Boyd	94	500	50 00
O G Boyd	246	500	50 00
Jno C Small	167	566	56 60
Geo Trefethen	90	500	50 00
Geo Trefethen	266	100	10 00
Samuel S Kelsey	104	50	5 00
Samuel B Kelsey	105	50	5 00
Samual B Kelsey	106	50	5 00
Samuel B Kelsey	107	50	5 00
Samuel B Kelsey	108	50	5 00
Samuel B Kelse	109	250	25 00
Samuel B Kelsey	237	1000	100 00
Samuel B Kelsey	251	125	12 50
Samuel B Kelsey	253	100	10 00
N H Wood	110	200	20 00
Henry Loring, Estate of	129	350	35 00
C H Leighton	151	200	20 00
C H Leighton	244	1 0	10 00
P B Rolfe	163	500	50 00
Peter Grant	159	500	50 00
Peter Grant	150	500	50 00
Peter Grant	185	300	30 00
Peter Grant	186	288	22 80
D H Bartlett	166	500	50 00
D H Bartlett	250	50	5 00
John Tehbets	178	100	10 00
John Tehbets	181	100	10 00
John Tebbets	183	2 0	20 00
John Tehbets	184	300	30 00
John Tehbets	221	125	12 50
John Tehbets	267	250	25 00
John Tehbets	268	400	40 00
C W Rolfe	180	200	20 00
James Wheeler, Trustee	197	2500	250 00
W T Garratt	204	67	6 70
Fred B Kelsey	238	250	25 00
Fred H King	239	250	25 00
A K P Leighton	240	250	25 00
Edward Fletcher	241	250	25 00
Mrs X John Little	142	250	25 00
Mrs Mary F Wade	243	250	25 00

And in accordance with law, so many shares of each parcel of stock as may be necessary, will be sold, at the office of the Company, on MONDAY, the 26th day September, 1892, at two o'clock in the afternoon of such day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of sale.

ROBERT McF. DOBLE, Secretary.

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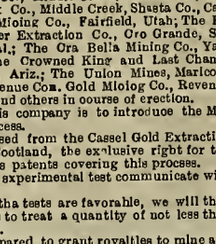

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We have purchased from the Cassel Gold Extraction Co., of Glasgow, Scotland, the exclusive right for the United States to use patents covering this process.

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If the results of the tests are favorable, we will then make arrangements to treat a quantity of not less than five tons in Denver.

We are fully prepared to grant royalties to mine and mine owners, or rights covering districts and counties.

The process consists of pulverizing the ores to a fineness of about 50-mesh, and then subjecting the same to an action of a very dilute solution of cyanide. A few tubs especially constructed according to our diagrams, for triturating, settling and filtering, is all that is required extra in connection with any kind of pulverizing stamps or rolls.

The total cost, as as rule, does do exceed from $2.50 to $5 00 per ton.

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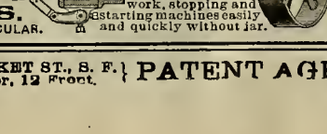

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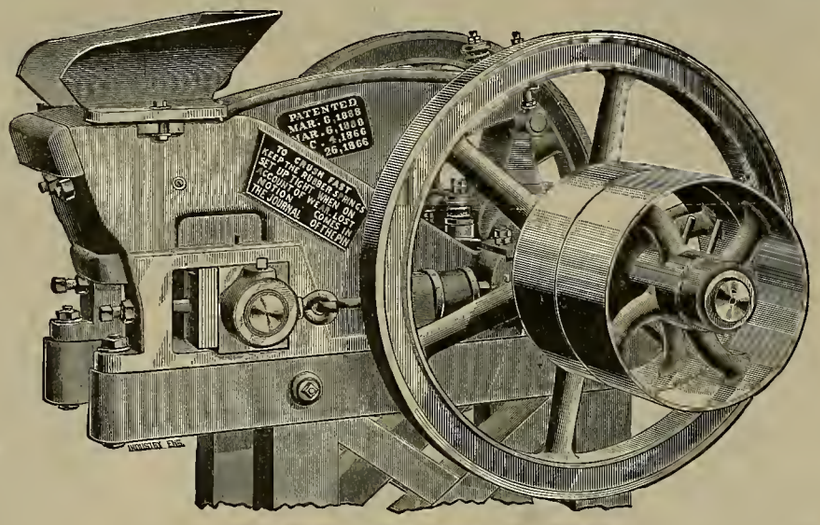

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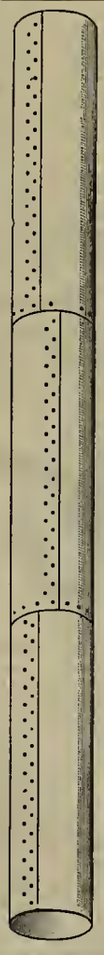

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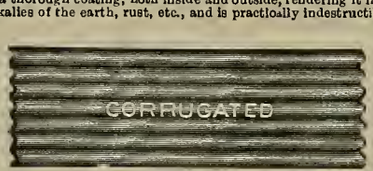

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In reply to your inquiry as to how the Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR. We can easily transport 65 tons of ore in 10 hours, with two men to load and one to tend brake, and with all the Wood Carriers on, we can transport 14 cords of wood in the same time.
When I look back upon the time when I was paying at the rate of $2.50 per ton for hauling ore, whereas it is now done at the rate of 12½c. per ton, making a saving of $150 per day, and also, where it formerly cost me $5.50 per cord for wood delivered at mill, it now costs me but $3 per cord making a saving of $2.50 per cord—I must say that I feel pretty well over my Tramway investment for it is a PERFECT SUCCESS.
JAMES BARRON, Supt.

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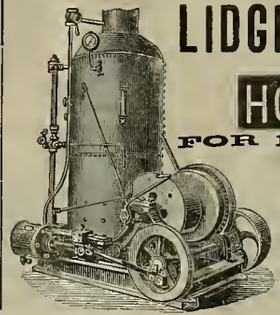

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MINING AND SCIENTIFIC PRESS.

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VOL. LXV.—Number 12. NEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, SEPTEMBER 17, 1892.

Three Dollars per Annum. SINGLE COPIES, 10 CENTS.

The "Success" Turbine.

Smith's improved "Success" water-wheel is being introduced on this coast by the Pelton Water Wheel Co. for the purpose of utilizing lower heads than the Pelton wheel can be operated under to advantage. It will probably be put on at Folsom, in this State, and at the Willamette falls. Tests made by the Holyoke Flume Co. on this wheel have shown an efficiency of 90 per cent, with a loss from full to half-gate of only 12 per cent, conceded to be quite the most remarkable showing ever made for a wheel of this class. The high efficiency under part-gate is a feature of special value, affording an adaptation to a variable water supply without the serious loss incurred in all other turbines, while the useful effect is maintained under the lowest head it is ever deemed practicable to utilize.

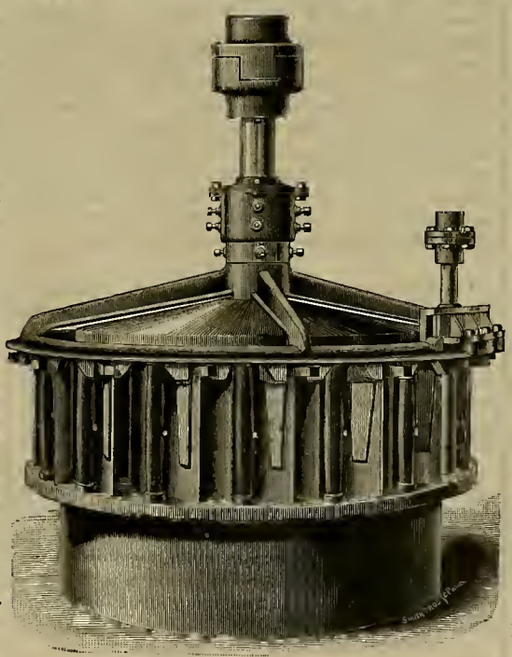
It is conceded that next to efficiency, no feature in a water-wheel compares in importance to that of reliability. They are generally used in remote and often inaccessible localities where repairs are made at great disadvantage and much expense as well as loss of time. Wheels of this class, it is well known, are in many cases very unreliable, involving a degree of uncertainty that discredits the many advantages such a power ought always to afford. The good accounts given of the "Success" turbine by parties using them in every variety of service and under widely varying conditions, give assurance that they embrace the best features of turbine practice, and that the construction is such as to afford all possible security against irregular and unreliable work.

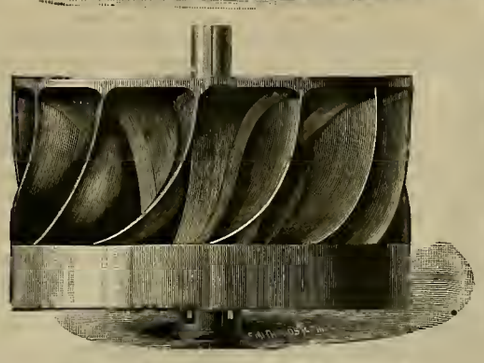
Some of the more marked and distinguishing features of the "Success" turbine are as follows: The gates are especially heavy and strong and are operated by a series of pivoted levers having no joints excepting the pivots on which they swing, making an entire absence of links, bolts and other contrivances for adjustment, which are a source of so much trouble in other wheels. The buckets in the runner are made of steel and are not liable to break by drift getting into them. The outer edges being turned forward they present sharp lines to the opposing or incoming water, materially reducing resistance and augmenting the power. These sharp edges also cut sticks, roots or other foreign substances so that they will go through the wheel without clogging it. The openings of the runner being larger than the gates, any obstruction that will pass the gates will easily pass the runner. But little resistance is presented when running in backwater, a point of much importance where wheels are submerged. The gates work with such ease and freedom as to admit of better regulation than can be obtained with any other form of turbine. Wear on the step is entirely obviated by the admission of water into a chamber at the lower end of the shaft, which prevents heat and consequent friction. These peculiarities of construction, it will be seen, are not only a great advantage in general utility and efficiency, but afford protection against accident and insure a degree of reliability not embraced in any other wheel of this class. Governors are furnished which are guaranteed to afford close and sensitive control under all variations of load. The "Success" wheel is largely used for driving electric machinery.

Among the Foundries.

The foundrymen of this city are reaching out for trade much more than was formerly their custom. This is especially the case with respect to the Mexican business, men being sent down into that country looking after orders. The Mexican machinery business should naturally come to this city, but the enterprise of eastern firms has turned some of the trade in that direction. Nearly all the large mining machinery used in the mines of Mexico is made in this country, and for many years the orders came to this city. The machinery was shipped to the coast ports and then carried inland. The completion of the railroad made it easier to ship to Chihuahua and Durango, as well as to Sonora and Sinaloa, the latter States on the coast-line. But the eastern manufacturers took advantage of this and entered the field also. The Mexicans are apt to give the orders to those who seek them, so that the local foundrymen of late years have been sending agents through the mining regions in search of contracts. It was on one of these trips that Mr. Fraser of the Risdon Works was murdered by his guide.

BELL'S IMPROVED STEAM HAMMER.





SMITH'S "SUCCESS" TURBINE WHEEL.

The foundry business in this city at present is unprecedentedly dull. With the exception of ship-building, there are very few large contracts in hand. Of course, there is more or less repair and small work, but most of the foundries and machine-shops are running short-handed. The larger shops have fewer men on the rolls than is usually the case at this time of the year, owing to lack of orders. There is no expectation of any special revival of business until the conclusion of the political campaign. At present, there is universal complaint of dull times.

Bell's Improved Steam Hammers.

The advantages obtained by the use of steam hammers are now universally acknowledged, not only in rolling-mills and large forges, but in every ordinary smith's shop, by which a great saving of wages, time, fuel and material is effected, besides improving the character of the work and decreasing the amount of labor required in finishing by machinery and vise work. Various systems have been devised and adopted to meet the want, but the cost has been the great obstacle to the introduction of steam hammers to the ordinary smith's shop.

Bell's improved patent steam hammers have completely overcome this obstacle. They are of very simple construction, having single-column standards, with bed-plates and cylinders cast in one piece, very strong, self-acting, and taking steam at both ends of the cylinder; all of the sizes striking a square blow. Either of the sizes will strike a heavy or light blow, as required, and can be worked either "double acting" or "single acting," the change being easily and quickly adjusted. They are superior to belt, trip and helve styles, easier to use and keep in repair, and much cheaper in cost than any form yet devised that will perform the same amount of service.

There are four sizes of these hammers built, the accompanying cut representing size No. 1. The sizes Nos. 2 and 3 will work up old car axles and make the best iron that can be produced for connecting and eccentric rods and all parts of engines and other machinery where the best quality of iron is necessary. They will also work up old scrap, quantities of which are always to be found in blacksmith shops, and produce the best of iron for all ordinary purposes.

The size No. 4 is constructed with the view of supplying, at a very moderate price, a hammer that will forge large and heavy cranks and shafts and the frames and other bearings of locomotives, not only with expedition, but with the greatest accuracy and saving of labor; and it is claimed that twice the number of locomotive frames and bearings can be turned out in the same time that can be done with the appliances hitherto employed in doing the same duty. With a heating furnace this size (No. 4) will work up scraps into billets for making car-axles, crank shafts and all heavy forgings which have heretofore required large and very expensive hammers to accomplish.

The sizes of these hammers which are usually adopted (being from one to six tons capacity) are found to be eminently suitable for iron and steel manufacturers, ship-builders, railway-car builders, engine-builders, wheel-makers, shipsmiths, iron-bridge builders, filemakers, cutlers, coppersmiths, gunsmiths, carriage-builders, bar-straightening for smithies and generally for pressing and stamping iron into required shapes. These hammers are built by David Bell of Buffalo, New York, and the agency for their sale here is entrusted to the Joshua Hendy Machine Works of this city.

THE Executive Committee of the California Miners' Association have passed a resolution postponing the annual convention from Oct. 10th to Tuesday, Nov. 15, 1892.

MINING AND SCIENTIFIC PRESS.

BY THE DEWEY PUBLISHING CO.

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CHAS. G. YALE, } .....EDITORS
ALFRED HOLMAN.....MANAGER

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO, SATURDAY, SEPT 17, 1892.

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Comment.

Melville Attwood, the well-known mining engineer of this city, recently had occasion to examine the milling methods of a mine in Siskiyou county, to find out why the percentage of loss was so large. In his report to the owners occurs the following: "The principal matrices of gold in auriferous veins consist of quartz and pyritic matter. The gold in the quartz is generally found in coarse or large particles and is easily liberated by coarse stamping. In California it is commonly termed 'free-gold.' The gold in the pyritic matter for the most part is in a fine state of division, and in the cubical pyrites sometimes by dissecting the crystals the cleavage faces will be found distinctly gilded. Therefore by fine stamping, like that in use at this mill, a very large proportion of the gold will be held in *suspension* and carried away." This is a very suggestive statement and bears out the ideas and experiences of others. Mr. Attwood made a microscopic examination of the pyritic crystals and was easily enabled to find the gilded faces. It is very possible that in other cases where the milling percentage obtained is small, it may be due to crushing too finely. If the crystals of the pyrites are broken and this extremely fine gold freed, it will doubtless, as Mr. Attwood says, be carried off in the flowing water.

It is a triumph of mechanics, rather than one of physical excellence, which has enabled a man to travel a faster mile than the fastest trotting horse on a circular track. Nancy Hanks recently recorded the fastest mile of a trotter on a circular track at 2:07¼. She afterwards reduced this time on a kite-shaped track. A few days after her first performance a young man named Zimmerman, on a three-lap circular track at Springfield, made a mile in 2:06 4 5 on a safety bicycle. It is noteworthy also that the mare made her fast mile with one of the new sulkies, having bicycle wheels, with pneumatic tires. In both cases the tires used were pneumatic and the wheels had ball bearings. The pneumatic tire is simply a large rubber tube filled with air, and so arranged that if the air leaks out it may be pumped in again, with a small air-pump which may be carried in the pocket. The original tires for bicycles were of solid rubber. Then came the cushion tire, of larger diameter, made hollow; and now the pneumatic is all the rage, and is applied to most of the new machines. With it one may ride over sand or pavements, heretofore impassable to bicyclists, since it gives a broader bearing surface and at the same time is elastic. It also takes a good grip on the surface and is not apt to slip or slide. The ball bearings of these machines are entirely different from the ordinary bearings or axles of vehicles. In the hub of the wheel is an annular groove containing a number of small balls of chilled steel. These encircle the axle of the bicycle, which passes through the center of the ring of bal's. The oil and graphite, or other lubricator, is placed in the box with the balls. It is obvious even to persons not well versed in mechanics that the bearings on which a shaft turns should be true circles concentric to its axis and therefore to each other. In a ball bearing the grooves or surfaces upon which the balls roll are true circles. Adjustment of the bearing so that it will run freely without shake or side-play is necessary, especially after wear. In the cap covering the balls, by screwing it up one notch the space allowed to each ball is narrowed one fifteen-hundreth of an inch, making a perfect adjustment for wear. In a modern safety bicycle, with its many bearings, there are 190 balls, including those in the wheels, the head and the pedals. The friction in the wearing parts has been wonderfully reduced. These machines are marvelously strong and light and may be considered one of the triumphs of modern mechanism. Very slight exertion is required to propel them. That great speed may be attained with them is shown by the record given above. Of course an exceptionally skilled man was required to accomplish the feat, but many riders come within a few seconds of the time in using these machines. By the way, it is of interest to note that in Germany alone 1700 men are employed in making the balls for these bearings, and England and this country there are many more.

A few cases of Asiatic cholera have appeared in the city of New York, notwithstanding the strongest quarantine against vessels from infected ports. None of the people who died ashore came in the vessels, and it is not known where they contracted the disease. The authorities are making every effort to keep the disease from spreading, and thus far have been successful. The appearance of the dread scourge in the metropolis of the country will have the effect of causing all other cities and towns to commence immediately with such precautionary measures as seem best. For the next few months there will be a spasm of cleanliness in all parts of the country. If the disease can be held in check in New York for another month, the cold weather will prevent its spread this winter, though it may be expected to revive with the warm weather next summer. However, by that time every preparation will have been made to fight its progress. It is not probable, therefore, that the cholera will obtain the foothold in this country that it has in parts of Europe. There need be no panic over the appearance of the disease, for Boards of Health and other official bodies will use every effort possible to reduce the mortality by compelling strict cleanliness of premises in all quarters.

Joseph Aron of No. 30 Rue Bergen, Paris, France, formerly a well-known operator in Comstock mines, has had Judge Hebbard's decision in the Fox *vs.* Hale & Norcross mining suit translated and printed, and has circulated thousands of copies among people in France, Germany and England who have been interested in Comstock mining shares. This result of this will be that it will be difficult to get any of these people to invest any money out on this coast, for they mix up California with Nevada. The revelations made in this suit, as to the methods pursued in the management of the Comstock mines, were startling and not at all calculated to give people confidence in the companies. Now that European mining investors are in a position to understand the decision in the case, it will be very difficult to get them to put money into mining properties out here.

At the last meeting of the Board of Supervisors of this city and county the Street Committee presented a resolution repealing the ordinance prohibiting the erection of poles and overhead electric wires excepting on certain streets, as the law as it stood prevented competition. Mr. Taber explained that the repealing of the ordinance would not give the right to build such roads unless the board should see fit to grant such privilege. The resolution was ordered to print. In most of the larger cities of the Union grave objections to the use of overhead wires are recognized. Boston has them, it is true; but New York and other cities still hold out against the trolley system. For smaller towns and for suburban traffic the overhead wire system answers well enough, but not for crowded thoroughfares of a great city. It is, of course, effective as far as moving the cars is concerned, and as a cheap form of construction, but the danger from live wires of this kind, when accidentally broken, is such that some other means of furnishing the current to the cars are being earnestly sought for. There is now on the books of this city an ordinance against the use of overhead wires for cars. In certain districts the electric cars would be found very useful, but the general introduction of the trolley would be objectionable. We have now the best system of streetcar service in the country. Cable roads are, however, expensive to build and for this reason many companies are anxious to introduce the trolley system where new roads are needed. If the Supervisors could be relied on to exercise good judgment in granting franchises, it might do to change existing conditions; at the same time, with the matter left wholly in their hands, the franchises might go by favor.

The Consolidated California and Virginia Mine.

The returns from this mine for the month of August are now at hand and do not give any particular cause for satisfaction to the shareholders.

There were 4350 tons of ore worked, which, according to the average car samples for the month were worth $112,708 50. The yield in bullion for the month was $72,849. Of this there was $32,170 in silver, from which 35 per cent or $11,259 50 must be deducted for discount on silver, leaving $61,589.50 as the net returns to the company.

The average car sample assay for the month was $25.91; average battery assay, $22.13. The return in bullion per ton, $16.74. The mill returned 64.63 per cent of the car sample assays, and 75 64 per cent of the battery assay. The net return to the company is $61,589 50 Out of this there is paid for milling and transportation, $6 per ton on 4350 tons which amounts to $26,100, leaving for the company $35,489.50. The original value of the ore at mill was $112,708 50, so a shrinkage is shown of $77,219.

The mill company which has the contract for working this ore is known as the Comstock Mill and Mining Co. According to the sworn testimony of John P. Jones and John W. Mackay, this milling company is owned by Jas. L. Flood, John P. Jones and John W. Mackay. The latter testified in the Hale & Norcross case that it was the former custom for mills on the Comstock to pay 65 per cent of the wagon-sample assay (equivalent to the car-sample) for ore and charge nothing for milling, as they could and did obtain ample remuneration for their work from the 35 per cent retained by them.

Under the present arrangement, the mills keep the 35 per cent and also charge $5 per ton for milling, and the transportation company (the Virginia and Truckee Railroad) gets $1 per ton for carrying the ore about 20 miles. The indications seem to be that the company will be compelled to assess its stockholders to pay the expenses of extracting this ore, which was worth $25.91 per ton, or $112,708.50 at the mine, and $35,489.50 in the company's office.

It is a notorious fact that this ore can be worked up to (in fact is now) 90 per cent of the battery assay, but the difference is fraudulently appropriated by the mill company. On the 4850 tons of ore belonging to the Con. Cal. and Virginia mine, worked during August, the mill company got for milling $21,750, and 15 per cent of bullion appropriated $16,906 27, making a total of $38,656 27. The mining company itself got $35,489.50.

It is such management as this that has driven the public out of the stock business. They see that ore assaying $25.91 per ton, when mined and worked on the Comstock, brings the company in debt, and they can easily see that nothing but fraud or the most reckless management could produce such results. Taking either horn of the dilemma they see that they will be the sufferers, while the millmen and those who furnish supplies and transportation will be the gainers.

It is useless for people to purchase shares in the Comstock mines until such methods as these are changed. Great incomes are maintained by them, it is true, but do not come to the shareholders who own the properties producing the ore.

THE CŒUR D'ALENE TROUBLE.—The nonunion miners have adopted legal tactics against certain property-owners in the Cœur d'Alene mining district, for damages accruing out of injuries received during the troubles there. Attorneys Hyde and Glass will file suits immediately for 12 clients in the State Court of the First Judicial district of Idaho against the Helena and Frisco Mining Company. The plaintiffs in the suits are men who were employed in the Frisco mill when the latter was blown up with giant powder, and who received various injuries at that time. The aggregate amount sued for will approximate $120,000, and the attorneys in the case believe their clients have excellent grounds for action. These men state that they were induced to go to work in the Frisco mill on the representation that there was no trouble, prospective or otherwise, and that their lives and property would be absolutely inviolate. Instead, they claim they were shot at, some of them wounded, and more or less of their private effects destroyed. The suit promises to be an interesting one.

An Astronomical Discovery.

On Friday night of last week E. E. Barnard discovered, with the Lick telescope, a new satellite of Jupiter. This is the first important discovery made by means of the magnificent instrument on Mount Hamilton, the largest refracting telescope in the world. This fifth satellite revolves in a period of 11 hours 59 minutes. Its distance from the planet-center is about 112,400 miles. It was observed by Mr. Barnard at east elongation September 10th, twenty hours and fifty-three minutes and twenty-one seconds Greenwich mean time. Its magnitude is the thirteenth.

From the amount of light reflected by this tiny moon, Mr. Barnard states that it is certainly not more than 100 miles in diameter, and is probably less. It is so close to the primary that the greatest possible distance from the edge of Jupiter at which the satellite may be observed is 36 seconds of arc, or say about two-thirds the diameter of the planet itself.

In speaking of his discovery, Mr. Barnard said that the new satellite is certainly as faint as the thirteenth star magnitude, and probably much less. In the great Lick refractor it appears as an exceedingly tiny star, in very rapid motion. The movement was clearly exhibited in the successive micrometer measurements, so that there could be not the least doubt about the character of the discovery.

Mr. Barnard spoke of one curious feature apparent in the study of the fifth Jovian moon. The period is so very nearly one-half a solar day that for months at a time only one elongation is visible at any one place. For example, at the present time only the eastern elongation can be seen in the United States, since the western elongation takes place during daylight. At the European observatories the reverse is the case, and consequently Vienna and Nice will for some time secure careful observations of the western elongations of this new body.

The four well-known satellites of Jupiter were the *first* heavenly bodies ever discovered with a telescope, having been found by Galileo in January, 1610, or over 282 years ago. Since then every astronomer has carefully observed and every telescope ever built has been pointed over and over again at the great planet and his retinue of four large moons. The great telescopes, year after year, have been employed during opposition, when the planet is seen to the best advantage.

It is to this fact that the discovery of the fifth satellite is so startling, astronomere believing there was nothing left to discover. The discovery ranks with that of Neptune in September, 1846, and the satellites Ariel and Umbriel of the planet Uranus in 1851, and the little moons of Mars, by Hall of Washington, in 1877.

Mr. Barnard has found more comets than any living astronomer, having discovered 16 in 12 years of extraordinarily hard work, yet all this is as nothing compared to his great find of last Friday night, when, for the first time in nearly three centuries, something was added to our knowledge of the moons of Jupiter.

This announcement will not only add to the laurels of this already famous young astronomer, but will give a reputation to the great telescope that one week ago was not thought of. Its work has thus far been somewhat disappointing, but hereafter more will be expected of it.

While Mr. Barnard's discovery will not add to our knowledge of astronomy nearly so much as discoveries made within the year and which have not been heard of outside of astronomical circles, it forcibly illustrates the fact that the solar system is not fully explored, and we may look for other startling discoveries within our own system.

Working Low-Grade Tin Ores.

We have not thus far been very successful with our tin-mining in this country. The California mine is rather pockety, and while tin has been produced, there has not been such a quantity as was expected. Still, a good body of ore may be met with in the prospecting operations at any time. The tin mines in Cornwall, England, succeed in working a very low-grade of ore indeed, and with experience, we may do so here. In the stockworks of Wheal Prosper and Mitchell, the killas is usually very soft and generally light-colored, *i. e.*, gray or white, or stained a yellowish-brown by oxide of iron. In some places near the veins the killas is converted into a soft tourmaline schist. The veins themselves are mere stringers, rarely more than one-eighth inch thick. In addition to quartz and cassiterite, a little gilbertite is noticed on them. The quantity of oxide of tin contained in the stuff is exceedingly small—not more than three pounds per ton of rock on an average—say 0.13 per cent—and it is really astonishing how such stuff can be worked without incurring a considerable loss.

Taking the oxide of tin, or "black tin," at £42 per ton, the pound is only worth 4½d., so that the ground as it stands is only worth 1s. 1½d. per ton. This amount has to cover all expenses of blasting, breaking, tramming a quarter of a mile, besides stamping and dressing.

Some of the reasons why the stuff can be treated so cheaply are stated by Prof. C. Le Neve Foster, H. M. Inspector of Metalliferous Mines, as follows:

1. The rock is soft and friable and easily stamped.
2. The tin ore is in large grains, consequently the rock need not be stamped fine, and the subsequent washing operations are greatly facilitated.
3. The substances mixed with the tin ore are specifically very much lighter and easily separated by washing. There are no pyrites to necessitate calcination.
4. There is waterpower at command.

In spite of all these advantages there is much to marvel at in the results; and, indeed, it is doubtful whether there is any place in the world where such poor tin rock is being treated as at Wheal Prosper.

Coast Industrial Notes.

A BRIDGE is being built across the north fork of Mad river, Humboldt Co., to Korbel.

THE Chino sugar factory is running night and day and turning out about 100,000 pounds of sugar every 24 hours.

THE Grass Valley Gold Extracting Co. is sending 50 tons of chloride of lime to San Francisco for disinfecting purposes.

THE Comstock Tunnel Co. has ordered smoke consuming locomotives from an eastern company. They are to be used in the tunnel for the transportation of rock.

THE Oakland Consolidated Street Railroad Company has applied for a franchise for an electric road on Second street between Broadway and Market. The application has been referred to the franchise committee.

J. H. HENRY and associates, the owners of the electric railway from San Jose to Santa Clara, have petitioned the Council for a 25 year's franchise to furnish electric power for mechanical purposes throughout the city of San Jose.

BIDS for furnishing 2500 tons of Sydney coal to the equipment department at Mare Island were opened this week, and the contract was awarded to Husband & Brooks of this city, who were the lowest among a large number of bidders.

THE proprietors of the Taylor Paper Mill, in Marin county, declare they will shut down the mills if they are compelled to obey the law which prohibits them dumping the refuse in Paper Mill creek. Suit has been brought against the mill company to compel it to keep the chemicals and refuse out of the creek.

EMORY OLSEN, a surveyor on the S. F. & Great Salt Lake R. R., says that the various parties are making permanent surveys, and that there are now two parties in the field between San Francisco and Oroville. When Oroville is reached from the south, the survey will be permanent and complete from San Francisco to Beckwith, probably to Salt Lake.

THE city of Alameda has ready for use a salt-water plant for street-watering. It is located next to the electric light works, near the bay shore, and there will be two hydrants —one on Park street and the other on Park avenue. If the experiment proves a success the system will be extended throughout the city, thus effecting a large saving, as the city is now paying about $3000 per month for fresh water.

BEHREND JOOST, representing the San Francisco and San Mateo Electric Railway Co., has made application to the Board of Supervisors for a new franchise which includes the route now being operated together with supplemental branches. Permission to use overhead wires is also requested. The desired change will not effect the present rate of passage and but one fare will be charged over the entire road.

THE following number of men is borne on the rolls of the various departments at Mare Island Navy Yard at the present time, and unless a great urgency arises the number will not be increased during the next two months, or until after the November election: Construction and repair, 390; steam engineering, 155; yards and docks, 102; equipment, 37; supplies and accounts, 23; ordnance, 13; medicine and surgery, 1; total, 721. The number of men actually at work is not more on an average than 620.

PRESENT appearances are that the granite-cutters' strike will continue for some time. The firm of Phillips & Co., owners of a quarry near Rocklin, has received a communication from its employes, announcing they had decided to demand $4 a day and eight hours on December 1st. Mr. Phillips declares that he will not accede to the demand because the men are under contract to work until next May for $4 for a nine-hour day. It is stated by employers that the Fresno county strikers are willing to work under the nine-hour schedule, but because the union in this city objects to such submission the present rupture continues.

THE prospects of the San Francisco and Great Salt Lake Railroad are said to be very encouraging. New capital from an unexpected source has been subscribed, and by the time the full details are made public all will be in readiness to commence the work of construction. E. L. G. Steele, one of the principal promoters of the undertaking, is authority for the statement that there is no doubt whatever of the building of the road. Four surveying parties are in in the field between Suisun bay and Beckworth pass, and the work is being done very thoroughly. The road from Sacramento to Oroville is to be built first and put into operation at once.

THE big lumber raft from Fort Bragg, Mendocino Co., arrived in this harbor safely on Sunday morning, in tow of the steam-schooner Noyo. Although rafts of piles have been towed down before, this is the first time that a built-up cigar-shaped raft of lumber has been successfully towed on the Pacific, there having been several break-downs in previous ventures of this sort. The raft is understood to contain 1,000,000 feet of lumber worth about $75,000. It was towed down in 34 hours. The Fort Bragg Lumber Co. had some trouble in launching the raft owing to its draft of water, but the spring tides floated it and the venture was a success.

THE new railroad from the vicinity of Lower Soda Springs, at Soda creek, has been built a distance of two miles, with roadbed graded another mile to the new sawmill owned by the Red Cross Co. This mill is located on Soda creek at the Siskiyou and Shasta county boundary line, and the railroad connection will afford an easy and cheap method of shipping lumber to the markets below or elsewhere. As soon as the railroad is completed to the mill, it will be started on cutting up the dense forests of timber in that section, with intention of extending the railroad to Battle's and McCloud river, where the Red Cross Co. own several sections of fine timber, and where another fine sawmill belonging to this company and other mills are located.

SALEM, Oregon, will soon have a fine electric light and power system. F. R. Anson, the manager, is engaged in making preparations for starting the new plant. The boilers and electrical machinery have arrived and are already placed temporarily, and the only thing to hinder the progress of the work is the nonarrival of the 375 horsepower Corliss steam engine which was expected here on the 15th of August from Sioux City, Iowa. Mr. Anson sets Oct. 15th as about the time when the new station will be started. He has eight dynamos, and expects to have two more at no distant day. One is a power generator with a horsepower of 125, with which the company expects to supply the power for the Salem Motor Railway Co.'s electric line and also for the innumerable dynamos which will be used to run sewing-machines, printing presses, etc., about town. There are also five arc dynamos, with a capacity of 170 lamps, and two incandescent dynamos with a capacity of 2000 lamps.

THE many lines of electric railroads now building in Oakland will be completed and in operation by the end of the present year. The Telegraph-avenue line, now under construction by the Pacific Improvement Company, which is said to be the finest piece of street railroad construction in the country, has been nearly finished and it is the intention to have cars running on the avenue by the 1st of January. The Fourteenth-street road, owned by the Consolidated Piedmont Cable Company, will be in operation by the 1st of October. Work on the electric road from East Oakland to central Oakland is progressing rapidly, and by the first of November this branch will be in operation, and then the cars of the Haywards road will be run into Oakland on the Berkeley company's new tracks. The Piedmont company intends to equip its West Oakland and Adelioe-street branches with electricity as soon as its Fourteenth-street road is in operation. At the last meeting of the City Council the company made application to extend its Adeline-street branch down Adeline street from Seventh to First.

C. A. MCFAUL, of Miller, having obtained a contract from the Southern Pacific for the supply of 200,000 7x9 railroad ties, has started three tie camps on the north fork of the Gualala river, Mendocino county, under the personal supervision of his brother L. R., who is tie receiver and general manager, residing at Camp 1, which is located about half a mile above the end of the Gualala Company's old railroad. There is a large body of timber to be worked, some of which is on large flats along the river. The Southern Pacific people here turned over a new leaf in the matter of receiving ties. In order to pass as first-class, a tie has to be almost perfect—no sap, no big knots, no windshakes, no weather cracks. So rigid an inspection has given the tie industry a bad black eye, as to meet these requirements a man, in order to make wages in a heavy and hazardous occupation, must have first-class timber. This nowadays is mighty scarce, as it is a select few among crews make $40 or $50 per month; others not so very select, and who hire their hewing done, from $25 to $30. One hundred and fifty ties is considered to be a good week's work; twenty a day is not to be sneezed at. First-class ties call for 10½ cents, timber down; second-class, 9 cents.

Nevada County Miners' Association.

At the annual meeting of the Miners' Association, Nevada county, the report of the secretary showed that the receipts from certificates amounted to $1195; donations, $315; total receipts, $1510. The total expenditures amounted to $1397.60, leaving a balance in the treasury of $112.40.

The total membership of the association is 1195.

The same constitution and by-laws as were previously in in force were again adopted.

The report of the executive committee was read and adopted.

Alf. Tregidgo was reelected president. The old vice-presidents were reelected, J. G. Mather of Malakoff being elected by acclamation to fill the vacancy caused by the death of D. R. McKillican. W. F. Englebright was re-elected secretary by acclamation. W. T. Morgan was elected assistant secretary, by acclamation. B. F. Snell was elected treasurer, by acclamation. The executive and finance committee were likewise reelected by acclamation.

Delegates to the State Convention, which will be held at San Francisco on October 10th, will be appointed by the executive committee, as there are to be 122 delegates. The president and secretary will issue the credentials. An effort will be made to send a full delegation, and all mem-

hers are requested to send in a list of persons who will go as delegates if elected.

A communication from the State Association, asking for funds, was referred to the executive committee.

Frederick Zeitler offered the oames of 25 new members, which increases the total membership to 1220.

More Cyanide.

SAN FRANCISCO, Sept. 12, 1892.

TO THE EDITOR :—C. H. Aaron's criticisms of my suggestions relating to the practical working of the MacArthur-Forrest process, seem to demand a brief reply. I did not intend to irritate anyhody, hut meant what I said for the good of practical miners especially, not for professional chemists, who are, like professional doctors, jealous of specialists.

He begins hy denying the "selective affinity" of cyanide for gold and silver, "dissolving them hy preference, leaving the hase metals untouched," under certain conditions, and then admits its correctness in the following words: "To the unchemical reader it may appear to he sustained hy the *fact* that *in practice* gold and silver are (more or less) dissolved, leaving associated iron pyrites, galena and some other hase metal compounds unacted on"—zinc blende, for instance. If that does not confirm the selective affinity theory, I do not understand plain English. The whole question depends upon whether cyanide of potassium is a positive or negative solvent. He asks, "What warrant is there for calling a solution of cyanide 'positive?'" None whatever, except what our reasoning power gives us. I arrested the idea without any such "warrant" as he will recognize. The *fact* which he admits, as above quoted, is established beyond question, and I offered my suggestions in explanation. He insists that cyanide, like acids, chlorine and other solvents in use, are negative and must necessarily attack zinc in preference to gold, hecause he can find no warrant in the hooks of the old chemists for any other conclusion. How far would electrical science have progressed in the last 20 years if Edison, Tesla, Brush, Thomson and other inventors had depended upon the writings of Faraday, Maxwell, Bequerel or Wedeidemann for authority instead of their own hrains?

Cyanogen is composed of two negatives—carhon and nitrogen—negative to gold, of course. Its position in the scale of electrochemical affinities has never heen determined, that I am aware of, hut it is probahly even more negative than oxygen, judging from its energetic action. As potassium is the most positive element in the scale, it is plain that, in a solution of cyanide of potassium, gold does not displace either of the elements composing it, hut uoites with the cyanogen, forming a double cyanide of gold and potassium; nor does zinc, when used for precipitation, displace the gold in the chemical sense of that term, but withdraws it from the combination hy the electrical effect of bringing the two metals—zinc in a certain condition and gold in solution—ioto contact. Yet the cyanogeo dissolves a portion of the zinc filter, forming a double cyanide of zinc and potassium. It is evident, therefore, that potassium is the ruling element of the solutlon, and it being intensely positive, we are warranted in concluding that the solution is of a positive character and will "seek out the most negative metals, and unite with them by preference."

What is wanted is a proeess that, "in practice," will extract the gold and silver from the ore, whether it accords with the theories of the old chemists and their followers or not. There have heen so many failures in mining under the charge of Freyherg and other scientific graduates that "practical men" are in demand, and that class, when the opportunity presents, will pick up enough modern chemical knowledge to qualify them to handle such questions as have arisen in using the cyanide process hetter than professionals whose heads are crammed with fossil theories and precedeots. I am not interested pecuniarily in that process (hut have a hetter one to introduce presently), yet I can see great merit in it, and consider it my privilege, if not my duty, to contribute what I can to the successful subjugation of the ohdurate sulphuret. The failures that have occurred in working ores hy cyanide are easily explained when investigated hy "practical" chemists. That at the Gold Blossom mine, in Placer county, as described to me hy persoos present during treatment, resulted from using too much cyanide, and from the presence of zinc in the ore, which, heing taken into solution along with that dissolved from the filter, charged the solution so heavily with zinc that it was incapable of acting energetically on the next trial. The gentleman principally interested is enthusiastic in favor of cyanide as a solvent, aod finds fault principally with the zinc precipitant. It is had and will he remedied as soon as circumstances will permit, hut not hy those who do nothing without "warrant" derived from the works of the old chemists. The fnture of successful mining, I venture to prophesy, will be conducted by practical men who stody the electrochemical relations existing between the useful metals and their solvents, with special reference to practical success. M. T.

Experiments with the New Process.

REDDING, SHASTA CO., CAL., Aug. 24, 1892.

TO THE EDITOR:—As cyanide items are now in order, I will give you the result of a few limited experiments:

The ore was put through a 60-mesh screen, and carried three ounces gold to two ounces silver; it also contained two and three-tenths per cent of copper sulphide, two per cent zinc sulphide, antimony undetermined, and iron sulphide. The sulphides were prohahly 45 per cent of the whole, while the gangue was a clean, white quartz. Ten pounds of the ore was put into a crock having a false hottom and the liquid made to circulate from the bottom up through the pulp. Three-quarters of one per cent solution was used for 24 hours; less than 20 per cent of the gold went into solution. A two per cent solution for the same time gave 35 per cent in solution. A ten per cent solution gave 40 per cent. I next put a carhon one-half inch thick into the hotton of the jar and suspended another in the top; these presented two square feet of surface each. A current was made to pass through the hottom carbon, using it and the pulp as the anode and the suspended one as a cathode. The current from the dynamo was a pressure of ten volts and a total output of 400 volts. In two hours less than one per cent of gold remained in the pulp, while the carhon cathode contained the metals which went into solution. With large quantities of ore, if the electric method—which keeps the solution clean and prevents polorization and thus facilitates rapid decomposition without rendering the solution normal hy the addition of copper and zinc—gives anything like approximate results, I think a great advance has heen made on the present crude methods.

GEO. A. FITCH.

Pirn Mining District.

PIRU MINING DISTRICT,
VENTURA CO., CAL., Sept. 10, 1892.

TO THE EDITOR: While writing you in regard to renewing my subscription to the MINING AND SCIENTIFIC PRESS, I may say that I consider it the hest paper a miner can take if he wants to keep posted on the many great improvements in the mining and milling of ores, and in all of the other great inventions of the age. I think I have heen one of your subscribers for over 20 years and I have heen well satisfied with your paper. One thing I like ahout it is its good, sound, moral sense in its editorials.

But this district is what I started to write about. There is very little known or said ahout Piru minlng district, and as a general thing, those who talk the most about it know the least. There are very few mining men in the district, and there never has heen a haker's dozen in the last six years I have been living here. As to genuine practical and scientific experts I have not had the good fortune of meeting one in the district. It makes an old miner laugh (who has heen at the business for 35 or 40 years) to hear some of the would-be experts explain the different formations. Several of them used to he, during the boom times in Los Angeles city, curbstone real estate agents. When the boom busted they were also husted, and hence now we have them for mlning experts.

But notwithstanding all the great strikes we read of being made in Arizona, Colorado and other places, there have been over 60 mining locations recorded here since January 1, 1892. The Haylock Brothers, G. T. Read and A. J. Hazlett have built a wagon-road from Cuddy's ranch up four miles on the west slope of the Frazier mountain to the Fair View mining claim, White Mule mine and Bunker Hill mine. Hazlett and Harhell are putting up a five-stamp quartz mill on the White Mule mine. They have part of the machinery on the ground and expect the rest to he hauled up next week. Over at the Frazier mine, five miles east of the Fair View claim, they have just put up a ten-stamp mill and are running 12 hours per day, water being scarce. Spence & Bicknell and others, owners of the First National Bank of Los Angeles are the present owners of the Frazier mine. This mine has heen worked off and on for years, this last mill being the third erected. On that claim, that there have been thousands of dollars taken out is beyond doubt. That there have been thousands spent foolishly is also true. This mine has very rich ore in it.

The Stella Gold Mine.

BANNING, CAL., Sept. 2, 1892.

TO THE EDITOR:—Taking courage from your kind invitation to subscribers to occasionally send descriptions of valuable and interesting claims, I send the following unscientific account of "The Stella Gold Mine," receotly located in San Diego county, on the north slde of Pleasant valley, 25 miles north of Indio, on the S. P. R. R.

The outcroppings run directly up and down the north side of the hill on which the claim is located, heing about 17 feet hroad at the surface of the ground and widening to a width of at least 20 feet at a depth of 20 feet, where a crosscut tunnel has been driven. The ore is an ash-colored porphyry, easily crushed, and full of small cubes of oxide of iron in which the gold in coarse grains can here and there he seen. The ore is low grade, hut perfectly free-milling, apparently; $15 in an assay value of $17.83 per ton heing extracted hy the use of a small, iron, hand-arrastre. The points of interest are the favorable character of the ore and more especially the immense deposit of it, as it can he quarried rather than mined. There is cedar fuel within five miles and pasture of the hest at hand all the year rouod. Water will have to he procured by diggiog or horing, or else piped several miles. There is surface water sufficient for camp use. The owners would like to show this property to practical miners seeking investment, not to sell, hut in hopes of receiving aid in procuring water and machinery in return for an interest, hut we do not want to handle a dollar until it comes as profit from the mine. Would he glad to meet (with a wagon) at Indlo any one feeling interested, and would take good care of them.

JOS. J. KNOX.

No More Cyanide at Present.

TO THE EDITOR:—The article of M. T. on "More Cyanide" (advaoce proof of which I have seen) is *unanswerable*. It does not "irritate" me, hut it does amuse me immeosely. Is the MINING AND SCIENTIFIC PRESS becoming a comic paper?

I am flattered by the category in which M. T. places me, for, while I know that even the great chemists make mistakes occasiooally, yet I am content to he a "follower" until I know that they have done so. I know of one point at least in which even Fresenius is "off." Seriously, I think well of potassium cyanide for extracting gold, and hope some one, whether practical or not, will soon find a better way of collecting the metal from the solution, and let us use it on more reasonable terms than those demanded hy the MacArthur-Forrest folk. C. H. A.

Personals.

J. T. GOULD, the well-known miner of Dutch Flat, is in the city.

FOREMAN RAY of the Providence mine, Nevada county, has resigned to go to Ecuador, aod John McLaughlin takes his place.

E. C. PAXTON is superintendent and part owner in the Potter mine at Jordan Hill, Butte Co. W. T. Coleman owns an interest in this claim.

SAMUEL BAGLEY, who has heen prospecting for some time on the El Dorado Summit, in Weaver district, A. T., has struck a fine ledge of silver ore.

JOHN BARRY has nearly all his mill machinery moved from Cerbat, Arizona, to the Minnesota mine, where a concentrating plant will he in full operation shortly.

MR. GILSON of San Francisco, a prominent mining man, owner of the Signal mine in Mohave county, A. T., and the Minas Prieta in Sonora, Mexico, has gone to the White Hills, Arizona.

WM. SKERM, an experienced Comstock miner, has taken charge of the Ontario and Daly mines, Utah, as general foreman or assistant superintendent, and in future will have charge of the working of those properties.

LOUIS JANIN, the mining engineer, has moved into offices in the Crocker huilding, hut Mr. Ross E. Browne still retains the rooms on Sansome street, which have heen occupied jointly for some time hy these gentlemen.

J. J. BURT of Tres Pinos, San Benito county, is in the city negotiating for improved rolling stock of the James single-track railroad, of which he has 12 miles running successfully to and from his lime works, in the Gavilan mountains.

J W. AKERS of Santa Fe, New Mexico, and Mr. McLaughlin, manager of the copper plant at San Pedro, New Mexico, and superintendent of the Lincoln Lucky mine at that place, have returned to Kingman from White Hills and Gold Basin.

CHAS. E. UREN has gone to the Lone Star mine in Gold valley, Sierra county. The ledge, for which they were running was reached. It is three and one-half feet wide, and shows free gold. This mine is owned hy Grass Valley parties, and they are now investigating the strike.

JOHN SEVENOAKS, an agent for R. C. Chambers of Salt Lake, has contracted for the purchase of the Gold Eagle claim in Ferguson district, Nev., owned by George Petty and China Dick, for $6000. This claim is situated some distance south of the April Fool mine, and recently showed up well.

WM. G. RAYMOND, a civil engineer in this city, formerly connected with the State University, and of late a member of the firm of Raymond & Bay, has been appointed to and has accepted the chair of Geodesy, Road Engineer and Topographical Drawing in the Rensselaer Polytechnic Institute at Troy, N. Y.

WM. MAYGER is superintendent of the St. Louis M. & M. Co., Montana. He has brought suit against the Montana Company (limited) in the United States Circuit Court for $500,000 It is claimed that the Montana Co. has, ever since last October, been taking ore from lodes on the St. Louis claim, through the shafts of the Drum Lummon, which adjoins the St. Louis.

Wide or Narrow Tires.

Our readers will be interested to see a statement on this mooted subject which the famous wagon-huilder, Clem. Studehaker, writes for the *Breeders' Gazette:* There can be no doubt that the general adoption of wide tires would work less harm to poor roads than would narrow tires. Broad tires for wagons, of any width that would be practical, would not, in my opinion, make good roads. They would simply have less tendency to cut up poor roads than would the narrow tire. The harm to wagon roads commonly occurs when the surface is saturated with rain and the roadbed is soft and yielding. At such times loaded vehicles fitted with wheels with narrow tires cut out ruts in the roadway more or less deep, according to the length of the wet spell and the frequency of the passage of such vehicles. When, however, the roadhed is solid and care is taken to promptly fill up inequalities which may he created hy reason of the wear and tear of the surface, in such event narrow tires are, to all intents and purposes, no disadvantage to the roadhed, while they are unquestionably of greater advantage to the vehicle. Narrow tires tend to lighter draft in drawing loads over smooth roads and over soft roads. Over surfaces that are sandy or merely yielding in their nature the wide-tire wagons give the hest results. The wide-tire wagons are accordingly better for general field use. We have, hy the aid of a dynamometer, made a series of exhaustive experiments with the wide and narrow-tire wagons, and the result of these experimeots justifies the statement contained in the foregoing Concerning the disposition of manufacturers toward the construction of vehicles with wide tires, I may say that we are prepared to manufacture these wagons in accordance with the demands of the market. It is oevertheless true that the supply of timber for fellies for wide-tire wagons is less abundant than that which is suitable for narrow tires. On this account wide-tire wagons are more expensive than those which have the usual tire, and in case of a greatly increased demand for them, the timber supply of this nature already heing somewhat scarce, the tendeocy will be to still higher prices for wide-tire wagons.

The World's Fair Buildings and Grounds.

As in ancient times all roads led to Rome, so in present days all fairs point to the great Exposition at Chicago. Naturally the best which the local fairs bring to light will be gathered in to honor the greater occasion. This fact is giving increased interest to our district and State displays.

A beautiful and suitable site was selected for the exposition, containing fully one thousand acres, charmingly situated on the shore of Lake Michigan. Jackson Park, in the southern section of the city, was selected as the site for the main exposition; the Lake Front, near the heart of the city for part of it, and the Midway Plaisance and Washington Park adjoining Jackson Park for other parts. Upon these parks there had already been expended nearly $4 000,000 in improvements prior to their being selected as the exposition site.

In the winter of 1891 the portion of Jackson Park to be used for the fair was a soft, marshy ground, shelving in irregular stretches to the water line. Now it is a firm level, a smooth, sandy surface upon a clay subsoil. It is now a level surface to the line of the lake, a surface a mile and a half in length and, at its southern extremity, nearly a mile in width.

As shown in the view upon this page, the available water has been grandly used in the design of the grounds. There is a large lagoon enclosing an island upon which some native trees are retained, while all other space has been fully planted by the horticultural department. The introduction of this island affords a natural scene in refreshing relief to the grandeur of the buildings, and, through its sylvan qualities, to the crowded and busy aspect that must be looked for almost everywhere else within the grounds.

In the picture a canal is seen to extend southward along the main building, and into a large water basin which is to form the center of a great square about which the principal buildings of the Exposition are grouped. Fountains will be in operation in this basin, forming a brilliant spectacle in the sunlight, or when illumined by colored incandescent lamps at night. The banks of these land-locked bodies of water are to be finished in a manner appropriate to the various localities through which they pass. The borders of the canal and the basin in the court will have embankments of stone or brick, surmounted by parapets or balustrades of stone, iron, brick or terra-cotta, and opening upon steps and landings, for the use of boating parties. In fact, much of the travel from building to building will be by means of passenger boats upon these waters. This facility of movement will be grateful when the visitor finds extreme objects of interest over a mile apart.

Many of the buildings shown in the view have already been separately illustrated and described in our columns. The lines under the engraving will serve to locate leading structures. One of the most interesting features perhaps is the pier shown in the foreground, which has been constructed 1000 feet into Lake Michigan. The floor of this pier slopes gently from the shore, so that visitors who arrive by water may get an unobstructed view of the court and its surroundings, the paved beach covered with people, and the architectural grandeur of the most imposing and important buildings of the Fair.

Although the California building is not shown in the engraving, its location is designated. The other buildings not named are those erected by different States and foreign governments.

Every effort will be made for the accommodation and comfort of visitors. All walks and outdoor places for assemblages of people will be furnished with numerous seats and resting places, and will be paved with mosaics of brick, stone or concrete blocks, except where gravel or stone chips may seem more expedient. The grounds will, of course, be highly ornamented with shrubs, trees, turf and flowers, most of which have been planted.

A Government Sugar Station in California.

Much interest pertains to an enterprise which will be entered upon in this State through the zeal and persistence of Hon. A. Caminetti of Amador county, who made a good record for activity and accomplishment during his first session as a California member of the House of Representatives. Though he had greater undertakings on hand, Mr. Caminetti was possessed with a deep conviction that California should make systematic experiments with cane sugar production. The result of his effort was an appropriation of $20,000 for the first year, with which will be established three stations specifically devoted to experiments with cane sugar, one in Florida, another in Kansas and a third in California. To show the aims and purposes of this measure as applied to California, we make the following extract from a speech made by Mr. Caminetti near the close of the last session of Congress and published in the *Congressional Record:*

In support of the provision of the bill now under consideration, placing it in the discretion of the Secretary of Agriculture to make experiments in the planting of sugar cane, and the production of sugar therefrom, on the reclaimed swamp lands of either the Sacramento or San Joaquin valley, in California, I desire to submit the reasons that prompted me to offer the suggestion in the Committee on Agriculture.

While considering the financial necessities of the Department of Agriculture for the next fiscal year, the item appropriating money to continue experiments for existing sugar stations was carefully examined.

It appeared at the hearing thereon that at least one station would be discontinued at the end of this year, the object of its location having been accomplished. It further appeared that at the station in Florida remarkable success was obtained in both quality and quantity of production. While Prof. Wiley was stating the probable cause thereof, the fact developed that the experiments had been made on reclaimed swamp lands of a like character with thousands of acres situated in the valleys mentioned.

This induced me to enter them for the coming vacancy.

I rely upon the qualities of our soil and existing favorable conditions to justify the action of the committee. I have investigated the climatic characteristics of Florida, and find many points of resemblance with those of California. This accounts for the success both have attained in the cultivation of citrus and other fruits.

I quote a few extracts from a report on the Florida sugar fields:

"It was altogether beyond belief at first, that any one should be wild enough to talk of turning the Florida sand into cane juice. But the rumor came from many quarters, and at length, after an interval of a year or two, came the report that sugar had actually been raised in Florida. The objection I sometimes heard urged, that occasional frosts would injure the cane, was of no moment; for sugar has long been profitably raised in Louisiana, where they not only have heavy frosts, but have also thick ice, and sometimes snow."

This offers our people encouragement, as it tends to demonstrate that success awaits its cultivation in California.

The beet-root sugar industry is an established fact with us already; and there is no doubt in my mind that the experiment to be inaugurated will fare equally well.

The policy of the Government in granting a liberal bounty to the sugar-producer commits us to proper effort in hastening the time when the home market may be entirely supplied from our own plantations.

In furtherance of which purpose science and skill should be directed toward the discovery of methods to cheapen the cost of cultivation and augmenting the product within the present field of operations.

As our home consumption, in addition to the domestic product, calls for large importations of foreign sugar, thus crediting other nations in our trade relations with many millions of dollars annually, it is obviously sound public policy to extend this field of research in new regions.

The success of the proposed experiment will introduce a new branch of agriculture on the Pacific coast, yielding a ready

BIRD'S-EYE VIEW OF THE WORLD'S COLUMBIAN EXPOSITION, CHICAGO.

ravenue and adding to the locality suited to its cultivation by the establishment of factories, giving employment to many people.

The station to be established will be under the direct control of the United States Department of Agriculture. Machinery already owned by the Government, and now in Louisiana, will be moved to this State for the equipment of the new station. Mr. Caminetti has had especial reference in his work to the lands of the San Joaquin and Sacramento rivers, naturally moist and rich, and of which there are vast areas which await profitable uses. Tenders have already been made of suitable tracts of thirty to forty acres each. We presume it will not be long before steps are taken to make a suitable selection and to begin the work contemplated by the appropriation.

THE Golden Fleece mine, Lake City, Colorado, is shipping its ores by express to the smelter, it being too rich to send by freight. The probability is that they have not so very much of this class of ore, for such things happen in most mining countries. From the pocket mines in Tuolumne county, this State, bunches of ore worth proportionately $100,000 a ton have been taken, but they do not find even a ton of this kind of rock. The Golden Fleece people say their ore runs from $5000 to $10,000 a ton.

THE San Francisco Cremation Company has secured an acre lot in the Cypress Lawn Cemetery tract in San Mateo county, and upon that will be erected buildings to cost $25,000. The company has decided to adopt the Snyder system of cremation, now in successful use at Hamburg and New York.

Mechanical Progress.

Iron Bridges.

The questioo of what to do with iron bridges is becoming more and more important every year. It is now about 50 years since railway building commenced in earnest on this continent and abroad, and within the half-century, every civilized country has been covered with a network of iron tracks Of course, the construction of railways has involved the spanning of many thousands of roads, brooks and ravioes with bridges, which were at first of wood and iron. The wooden bridges, where tbey have not been already burned away, or replaced with fireproof material, are, as a rule, still serviceable, if they were properly designed in the first instance; but the older iron bridges have fallen into a state not exactly of decrepitude, but, we might say, of diminished vital power, which gives much reason for anxiety.

The first type of iron bridge for wide spans was the suspension bridge, aod so many of the early suspension bridges have failed, through the corrosion and disintegration of their important members, as to lead the French engineers to the opinion that 40 years is the limit of life for iroo suspension bridges, and that, in computing the cost of railway construction and management, provision should be made for replacing them entirely at the end of that time. Whether any similar limit should be set to the life of iron-girder bridges is not certain. Many such bridges have failed through decay; but whether decay in a girder bridge can be easily detected, and the weakened members economically replaced or repaired, is a problem not yet solved.

One thing seems to be agreed upon, that the tests ordinarily applied to old bridges suspected of serious corrosion are far from being adequate. The common method of testing is to run a train of locomotives on the suspected bridge, and if it resists the strain due to this load it is presumed to be capable of supporting safely the effect of ordinary traffic. But experience shows that bridges thus tested have failed soon afterward under moderate strains, and it is now recognized that the simple passage of a string of locomotives over a bridge shows little about the strength of the lateral bracing, the floor members or many other essential portions the failure of which under the passage of a train will destroy a bridge with nearly as much certainty as the bending of a girder under a mere vertical strain. No doubt the weakness of these members can also be detected by appropriate tests, but a thorough test of an old iron bridge, covered with rust and many coats of paint, is a difficult matter, and the time is to be anxiously looked for wben all railway bridges wil be of masonry, which ought to last for many centuries, if properly designed. —American Architect.

Improvement in Mining Methods.

At a recent meetiog of the North of England Institute of Mining and Mechanical Engineers, presidenl J. B. Simpson, in an address oo improvement in mining methods, said that a great item in the cost of working coal was that of its conveyance from the face to the shaft. In the majority of collieries this consisted of three distinct operations: (1) Conveyance from the face to the point where the main borse roads or self-acting inclined planes end; (2) from the station to which the hand or pony putters had conveyed it, and the hauling thence by horses or self-acting inclined planes to the engine plane landing; and (3) from the termination of the last haulage to the shaft by means of engine planes. Summarizing the cost of these three different haulages, be gave it as 5d per ton per mile. He feared he could not suggest in what way this could be cheapened; how far the application of electricity might affect any portion of the cost they had not had sufficient experience to judge, but no doubt ere long electricians would assist them in the conveyance of mineral underground both in economy and efficiency. The question of the transmission of power underground for the various purposes of pumping, hauling, coal-cutting, etc., had of late occupied a foremost place, and recent papers had enabled them to see the great strides which the application of electricity was making. Compressed air for deep and fiery mines possessed great advantages, but its coefficient of useful effect, being only about 30 to 40 per cent, and its heavy cost, militated against its general use. Steam conveyed down shafts was common, but was seldom applied for long distances. The question was of such importance that he would venture to suggest tbe appointment of a committee to investigate the chief systems (1) by steam, (2) by ropes, (3) by compressed air, (4) by electricity, (5) by petroleum and gas engines, and by other means. The substitution of machinery for the labor in hewiog coal, although introduced many years ago, did not seem to have made much progress, but no doubt they might look forward to the lesseoing and cheapeoing of labor in drilling holes in coal and stone being possible when a general system of electrical transmission of power is adopted. The great quantity of coal consumed in the production of steam for the working of the mines was a serious question; he estimates that about five per cent of the total output was used in this way. In the defense it must be said, however, that inferior and small coal was frequently used. In colliery engines they had not made such marked progress as other braoches of industry, where coal had to be purchased aud more economy practiced. To insure great economy, however, required io the first place a greater expenditure in the machinery put up. In mechaoical screening great improvements had been made.

THE CROTON AQUEDUCT SYSTEM.—Although something like $25,000 000 bave beeo expended already on the New York water system, including about $15,000,000 for a new aqueduct to provide adequately for the future wants of the city, a new dam in the valley of the Croton river is necessary, which will cost in the neighborhood of $4,150,000. So far as the Aqueduct Commissioners know, this is by a large figure the greatest sum ever proposed to be expended in a dam for aqueduct purposes, at least in this country. Contractors were invited to submit bids, and the enormity of the work, the large amount of bonds required, and the great capital necessary to carry it on, limited the number of bidders. Only six firms made propositions, and the sums they offered to do the work for varied in round numbers from $3,500,000 to $5 566,000. The contract was awarded to ex-Commissioner of Street-Cleaning J. S. Coleman at his figure of $4,140,573. Engineers the world over will watch the construction of this dam with lively interest. Some difficult problems are to be solved. An enormous watershed is to be controlled by it. It is to be furnished really as a reservoir, wherein are to be dammed up the entire weters of the Croton watershed; containiog thousands of millions of gallons, and from it are to be drawn such supplies as the present aqueduct does not furnish.—Iron Age.

TO DRAW COKE BY MACHINERY.—The H. C. Frick Coke Company is having a mechanical coke drawer made on a new plan. The machine will be from 8 to 12 feet long and made of cast iron. A narrow gauge track will be built along the yards about three feet from the coke-oven fronts. Along this track the patent coke drawer will be run. Two men will be required to operate it. The coke will be watered by hand, as at present. Two scrapers, similar to the ordinary short and long coke scrapers io use, will be swung from the machine on a crane. These two scrapers will be manipulated by the men with the machine. The coke will be booked down and scraped from the oven in mucb the same manner as by hand. Running from the iron coke drawer to the car on the track will be a long sheet iron scoop. The coke will be drawn directly from the oven into the car. This scoop, if satisfactory, will be the means of doing away with the enormous wheelbarrow and steep platform over the cars. If successful, the new drawer will draw an oven in one-third the time now required. A test will be made at the valley works.—American Manufacturer.

THE new underground conduit for electric railways has now been employed in the operation of one of Chicago's streetcar lines for a number of mnnths, and during that time many experiments have been made with a view to secure the best trolley to meet all requirements of the situation. In one method which seems practical the wheels are smaller than the overhead trolley wheels usually are and the grooves are shallower. A nearly universal movement is given to the wheels by especially contrived swivel bearings. When it is desired to have the cars run backward as well as forward, another set of springs are attached to the device. Contacts are made with bare conductors, and in operating the trolley the motorman brings it up or down according as he desires to make or break connection with the current.

SOME tinsmiths use leaden-headed nails for roofing purposes. The last strokes flatten the head over the hole made in tbe tin, and leaking is thus prevented.

Scientific Progress.

Artificial Precious Stones.

What promises to be a most important discovery has been made by one of our Glasgow scientists. Although imitation gems are obtaioable in any required quantity, the production of crystals having the hardness, durability, and other qualities, both physical and cbemical, of natural stones has been one of the unsolved problems of applied chemistry. The most advanced efforts up till now have beeo made in Paris, and the Freoch specialists have at least proved the possibility of producing sapphires, rubies and other stooes by artificial means, tbeir products being real gems, and not glasses. It is doubtful, however, if the originators of the French methods themselves claim that theirs are tbe methods of nature, and it is reasonable to suppose that the most natural method will be tbe most practically successful one. Although no geologist or chemist can declare the new process to be the process of nature, yet many analogies point that way.

Experimenters in tbis field may have beeo partly discouraged by the thought that the gems of nature were produced under conditions of enormous pressure, to which might have beeo added very high temperatures, and that they were in some cases the products of long periods of time. It is possible, however that too much weight has been given to this point. In the process now under notice no such discouraging conditions are present, and the method is wonderfully simple. Even working on the laboratory scale, using small vessels, stones have been obtaioed over one-sixteenth of an inch in diameter, and very large numbers have been formed approaching that size. There is no reason to doubt that working on a larger scale will yield stones of any size likely to be required. The noble nature of the products is beyond doubt, as they are very hard, infusible at all ordinarily attainable temperatures, and insoluble in any acid. The bulk of the gems are white or rather colorless sapphires. They are compact and transparent crystals, and many specimens have a splendid luster. By subsequent treatment some of them have taken on the sapphire blue.

Some of tbe specimens seem to contain a small amount of carbon. This element is sometimes present in small quantity in natural emeralds, a fact not generally stated in bnoks on the subject. In a few specimens the proportion of carbon seems to be considerable, and there are present individual crystals having physical properties more nearly allied to the diamond than to the sapphire. In nature diamonds are often found associated with other gems. In any case the products contain little or no silica, this compound being the characteristic ingredient of all kinds of glass. Apart from the possibilities of the process in the direction of producing the diamond, the chief point already established is that of having found an easy method of crystalliziog alumina. The Oriental ruby, Oriental amethyst, and other gems coming under the heading "Oriental," are all of them only variously colored sapphires, and alumina forms the chief constituent of the series.

There is little doubt that the process will yield the ruby and other varieties. Apart from ornamentation, their hardness will fit them for mechanical purposes, and their cutting power is remarkable, perhaps due to the small amount of carbon already spoken of. The author of the process has sought the opinion of several of the foremost men of science, and their general verdict has been very favorable. The discovery may prove to be one of the most important yet made in mineralogical chemistry, and the future developments botb commercially and scientifically difficult to estimate. The originator of the process is Mr. James Morris.—Glasgow Herald.

The Problems of Commercial Electrolysis.

Altbougb one of the earliest principles of electric action applied to commercial purposes, electrolysis bas, until a comparatively recent period, been confined to but a few fields of usefulness, and, with one or two exceptions, even these have been very limited in actual commercial product turned out. That there has been no lack of experimental investigations in this domain will become apparent upon even a cursory examination of the literature on the subject, whicb dates back over a hundred years. Of late, however, renewed interest is beiog manifested in electrolytic work, and in a variety of branches. Some of these bave already been cultivated to some extent, and others invnlve original processes. In a review of the problems of commercial electrolysis, submitted io a paper read before the London Institution of Electrical Engioeers, Mr. James Swinburne has outlined briefly the salient features of the most prominent electrolytic appliances of the day, both actual and proposed, and has made some suggestive remarks touching their probable future. Passing over the methods whose success is already well established, Mr. Swinburne, taking a broad view, asks: "Which of the oxidizing and reducing processes in use in chemical works can we advantageously replace by electrical methods?" He answers this questioo by stating, that "in many cases electrical methods are impossible; in others they are more expensive than those at present in use; but it is hardly too mucb to say that in an enormous number electrolysis is destined to play a leading part in the near future." Among the products included in the latter class, Mr. Swinburne mentions oxygen, which, he calculates, can be produced for less than one-tenth the selling price of the chemically prepared gas. In the production of caustic soda and its accompanyiog by-product, bleaching powder, Mr. Swinburne figures a large margin of profit by the use of the electric current; but he draws attention to the difficulty thus far invariably encountered in the gradual destruction of the positive electrodes, even carbon succumbing to the corroding action of the current, while platinum, though not entirely free from attack by chlorine, is too expeosive. Mr. Swinburne also draws attention to the fact that much has still to be done in the production of aluminum, magnesium and the refining of the precious metals directly from the ores; the recovery of tin from scrap iron, the production of ozone, electric tanning, etc. The field here open to practical commercial results is indeed without limit. The refining of copper alone is well worthy all the effort aod time that can be bestowed upon it, but by no means represents all tbat holds out promise of success. It may be well, however, to point out to beginners in electrolytic work that pitfalls may await them, and that a thorough study of the literature of the subject may forestall discouraging experiences.

ZINCS FOR GRAVITY BATTERIES.—One of the most valuable improvements made of late in gravity batteries is that by Mr. Georges d'Infreville, formerly electrician to the Western Union Telegraph Company. He has taken the old crowfoot zinc and so transformed it by his inventive genius that he may be said to have given a new and long lease of life to that familiar servitor of the telegraph. The economy that he proposes to effect is by no means insignificant. It is understood that the Western Union uses about 750,000 zincs every year, and if we allow but as many more for all the other telegraph systems and appliances of the country, including the Postal, the railway companies, the district messenger and other users, we find a consumption of about 1.500,000 zincs per annum. With Mr. d'Infreville's simple, beautiful and highly ingenious movements, the coosumption can be greatly reduced, the waste abolished and the service materially bettered. We must confess our admiration of the inventive faculty that can thus see in the most familiar and commonplace objects a large opportunity for its employment, and we trust that Mr. d'Infervlle will enjoy some return for the work and study by whicb tbrough, several years of steady experiment, he has brought his devices to perfection. His initial modification of the zinc bas brought with it a number of corresponding changes throughout the gravity cell, each requiring careful adjustment and each yielding its better result in a wider application of this type of battery.—Electrical Engineer.

AN ELECTRIC MINE RECORDER.—Ooe of the latest applications of electricity to mining operations is seen in the Metternicb lead mine in Belgium. Each bucket that arrives at the top of the shaft makes an electric contact, and a needle in the office indicates by a red line upon a revolving drum the number of buckets brougbt up. By this arrangement, it is possible to keep an accurate record of the regularity of the work, wbile the register prevents any disputes as to the quantity of material taken out of the mine.

ELECTRIC-LIGHTING has been abandoned on the Midland Railway of England after several years' partial use of it as being too expensive or unreliable, or both, for its use, and the company has adopted instead the Pintsch compressed oil-gas system as its standard method of illuminating passenger coacbes. It bas already erected tbree gas plants at various points along its line, and has ordered equipment for 886 cars.

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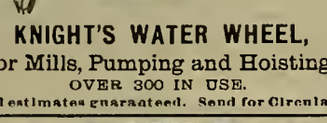

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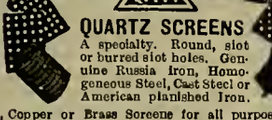

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Speed of Machinery at Night.

It has been very often asserted, and perhaps as often denied, by millers and others in charge of running machinery, especially machinery driven by water power, that it runs stronger at night than in the day-time. The men who have noted these differences have been and are, for the most part, simply artisans, says the *Mechanical News*, skilled in their business but unlearned in the arts and sciences in general, and therefore, without being able to explain the phenomenon, still assert with great positiveness that machinery does run faster or stronger at night than in the day-time. Those who contradict the statement lay some claim to a knowledge of the natural laws and natural science in general but nothing about the practical part of operating machinery. The one class asserts, on the strength of positive knowledge acquired hy continued experience and observation, while the other class contradicts on theory alone horn of a supposed knowledge of natural laws.

It is one of those peculiar cases where both are partly right and both partly wrong. There is perhaps no question but that machinery has heen frequently detected running stronger at night than during the day, but not necessarily so, and those observing these facts are right in the statement of the facts but wrong in the conclusion that the phenomenon is due to the fact of its being night-time. The others are wrong in contradicting the known facts hut right in the conclusion that night-time does not necessarily furnish additional strength or speed to running machinery. All motion is affected by the atmosphere and the denser it is the heavier and more sluggish the motion of machinery, or anything else that moves, and the more rarified and lighter it is the freer and apparently stronger motioo is. Not only that, but the water that propels the machinery is affected by the same causes. The lighter the atmosphere is the heavier, relatively, the water is and the greater its power for performing work. Thus, with less atmospheric resistance to motion and heavier water, the machinery necessarily runs faster with the same gate or quantity of water. Some have imagined that the heavier the atmosphere the more effective the water on account of the increased pressure on the surface of the water. That, however, is a manifest error, because the pressure of the atmosphere is equal in all directions, and the pressure above the wheel is balanced hy the pressure below it, while the increase of atmospheric pressure, which means an increase of buoyancy and density, reduces the actual weight of the water and therefore the power. This can be better understood if, in imaglnation, we we increase the density or specific gravity of the atmosphere to a point greater than that of water. The latter would thus have no power, but would float aimlessly in the atmosphere as vaporized water, or clouds, now do, or as lighter fluids or solids of a less specific gravity float on water. As an equality of density between the atmosphere and water destroys the effectiveness of the latter, so does any increase of atmospheric pressure or density affect the power of the power of the water in proportion.

When the barometer indicates the lowest pressure, then will water-driven machinery run the strongest, whether it be at day-time or night, and the condition probably occurs more frequently after the mid-hour of night than at any other time. But whether or not at that hour all nature, animate and inanimate, barring winds and storms, is silent and still and the dreamy miller or other watcher, having nothing on his hands or mind but to watch the mill, quickly notes any change that occurs in the running of the machinery—changes that would not be noticed in the busy hours of the day—are observed, and hence the reason for the belief that machinery runs faster at night than in the day-time.

THE WORLD'S CONSUMPTION OF COAL. A statistician has lately been engaged in estimating the world's consumption of coal. He divides his figures into four groups, embracing, respectively, the quantity of coal used in heating steam boilers, in the production of gas, in the extraction of metals from their ores and for household purposes. It may be taken, he says, that the total steam-engine capacity of the globe is equivalent to 10,000,000 horsepower, and that, having regard to the utilization of other fuels, the quantity of coal burnt with the object of producing steam averages 4.4 pounds per horsepower per hour, or an hourly aggregate of 12,000 tons. In all probability, however, this is an underestimate, as the efficiency of the world's steam engines is calculated hy some to be 20,000,000 horsepower. With respect to the manufacture of gas, the hourly consumption of the illuminating aeriform fluid is given as 5,000,000 cubic meters, which would necessitate the distillation of at least 10,000 tons of coal per hour. More difficult to calculate is the consumption of coal for the production of power and heating gas. It may be estimated, our authority thinks, at 4500 tons per hour. A large quantity of coal is used in the reduction of metals from their ores. It is calculated that in this way some 9000 tons of the mineral are consumed every hour. A special estimate gives the quantity burot hourly by works and factories at 5000 tons. The most difficult calculation is that of the domestic consumption of coal. It is estimated at 55,000 tons per hour, or 1,320,000 tons per day of 24 hours. This figure, however, appears rather small considering that in Great Britain and Germany alone, the daily output of coal in recent years has averaged 600,000 tons, and that the extraction in all other countries may be reckoned as one and one-half times this quantity.

THE INSIGNIFICANCE OF GRAVITATIONAL ATTRACTION.—From common experience we are apt to hold exaggerated notions of the power of gravity, says *Electricity*. Not until we compare it wlth other attractive forces, such as magnetism or electricity do we appreciate how trivial it really is. The fundamental experiments in electricity and magnetism, known to men for more than 2000 years, of lifting light bodies by rubbed amber, and iron filings hy means of a loadstone, demonstrate at once their incomparably greater power. If, for instance, the attracting body had the moderate dimensions of a hand-specimen of amber or loadstone, we should require it to be of so dense a material as to weigh 1,000,000,000 pounds instead of a few pounds, as usual, in order that its gravitational attraction should equal that of either of the two forces mentioned. It is obvious, therefore, that the imposing nature of the force of gravity, as equally compared with other attractive forces, is due not to its superior qualitative magnitude, hut to the enormous masses of the hodies which exercise it. Thus, while it requires the use of the most delicate torsion balance to demonstrate, even, the mutual attraction between a small and a large sphere of lead, yet where enormous masses, such as the earth, are concerned the attraction exerted by one hemisphere upon the other, probably exceeds a force of 500 pounds per square inch over a surface whose radius is 4000 miles.

THE MAGNETIZATION OF IRON IN AN ALTERNATING FIELD.—In a recent number of *Beiblatter*, Messrs. Gerosa and Finzi have published the results of investigations on this subject. The authors have previously shown that there is no turning point in the magnetization curve of iron traversed hy an alternating current, and at the same time placed in a magnetizing spiral-conveying alternate current. The maximum of magnetization is also less. The tests described in this paper were made with a Bellati dynamometer, at one end of the needle of which was fixed a magnetizing spiral (1000 per min.) containing a bundle of hard-drawn iron wire. A bundle of the same wires annealed was also tested. At the other end of the needle of the dynamometer was a compensating-spiral similar to the first, but without a core, and this was movable by a micrometer screw. The results showed no hysteresis for either hard or soft wires; the temporary moment of the annealed was the greater, and both approached the maximum of magnetization much sooner, though the actual moments were less with direct current.

THE MICROPHONE IN WARFARE.—An interesting suggestion has recently been made for the employment of microphonic apparatus, submerged in the sea, to indicate the rate at which a self-propulsive torpedo is traveling from the observer. The torpedo is so constructed as to generate in the rear intermittent, but regularly-timed, pulses or longitudinal waves in the water. These pulses may, or may not, be concerned in the propulsion of the torpedo. The microphonic apparatus shows the apparent pitch or frequency of the pulses as they are received at the starting point—a fixed point, of course, in the wake of the torpedo. This pitch will he lower as the speed of the torpedo increases, and it is claimed that, making due allowance for ocean currents, this system enables the path traversed by a self-propulsive torpedo to be traced out, by a continuous record of the speed at which it is moving, in a manner hitherto impossible. If we suppose that electro-motive power is conveyed to the torpedo through a wire cable, that is paid out to it as it proceeds upon its journey, then the conditions for isochronising the pulsations generated at the torpedo with those of a standard vibrator will he most favorable; and if the torpedo strike a net or other obstruction, this will at once he indicated by an apparent quickening of the pulsations, and the motive power can be regulated accordingly.

THE BALLOON IN WAR.—A series of interesting experiments was conducted the other night at Stanford Bridge grounds, London, with balloon and apparatus invented and improved by Mr. Eric Bruce for use in military signaling at night over intervening woods and hills, says the London *News*. Within the balloon are hung on a small swinging ladder six incandescent lamps, connected by insulated cahle with a battery on the ground, worked that night at 24 volts and giving 60 candlepower of illumination. By ready manipulation of the buttons at the instrument, the operator flashes on the translucent sides of the balloon the signals of the Morse or any code, and these can be easily read at a distance of six miles. The balloon used was a small one of 18 feet diameter, containing 1000 feet of gas, and was held by a cahle at a height of 300 feet. The strong wind prevailing rendered the position of the balloon unsteady and uncertain, but the signals were, nevertheless, read hy military experts and answered from a station on land. The experiments were witnessed by Prince Edward of Saxe-Weimar, hy military attaches of the Chinese and other embassies, and a numher of scientific men. The experiments were varied by hanging the lamps outside below the neck of the balloon and flashing direct. The illuminated balloon, when a few feet above ground, gives a beautiful light, and can be utilized when required for executing work at night.

STAINS ON COPPER AND BRASS.—An investigation has been made by Prof. Turner of Birmingham, England, of the red stains which so often appear on copper and brass wares, and which frequently cause considerable loss by the depreciation of such articles in store. As a general thing, it has heen customary to attribute these stains and spots to burning, sulphur, furnace dust and dirt, the opinion being also that such stains pass through the whole mass. According to Prof. Turner, however, none of these views is correct, the stains being confined to the surface, and nodules are never observed. Finally, on evaporating water, salt water, pickle and dilute acids on the surface, or writing with such ingredients on the brass, he obtained stains, especially when chlorides were used, but not with zinc chloride. The conclusion is that chlorides attack the zinc and liberate the copper, hut zinc chloride cannot do this, the stains are, therefore, caused by the water being allowed to dry on the material after washing, on the completion of pickling. The hrasses themselves are found very uniform. It is remarked that, as the water of Birmingham is notahly impregnated with chlorides, this fact accounts for the excess of such trouble in that locality.—Manufacturers' Gazette.

CELLULOID.—It is said that celluloid was discovered in 1689 by Hyatt. It is prepared hy directing a jet of a mixture of five parts sulphuric acid and two parts nitric acid upon a roll of unsized paper, which is slowly unrolled by machinery to receive it. It then becomes pyroxylin, a variety of nitrocellulose. After washing, the compound is ground with camphor until thoroughly incorporated, and then dried under a hydraulic press hetween bibulous paper, again ground and compressed in a special apparatus and heated to a certain temperature, when it becomes a translucent, hard and elastic substance, capahle of high polish. When heated to 250° F. it becomes soft and malleahle, can be drawn into very thin leaves, which, being mixed with various colored substances, is made into a variety of articles. It is soluble in methyl alcohol, amyl acetate, a mixture of ether and alcohol, either ethylic or methylic, in a solution of zinc chloride, in twice its weight of hydrochloric acid, etc.

HARDENING COPPER.—Quehec scientists say that one of the most wonderful discoveries of recent years is that made hy a poor hlacksmith of that city named Ferdinand Allard. It is the long lost art, known to the pyramid builders of Egypt, of hardening copper. Axes and other edged tools made of hardened copper have been exhihited by him, which in edge and temper rival the hest steel of the present day. Allard prepared a sheet of his hardened copper one-fourth of a line in thickness and had it tested at the government rifle ranges there. At the first shot fired from 40 yards distance the bullet was shivered into a thousand fragments. On the second, the missile striking the copper more fairly, was completely flattened, but remained imbedded in the plate, which it merely dented lightly, without cracking it in any way. This is claimed by experts to be vastly superior to anything the best steel could do under like circumstances, and the matter is to he hrought under the immediate notice of the British Lords of the Admiralty. The leading military authorities in Quebec express the conviction that if, on further trials, the discovery maintains the same superiority most important results must follow and existing systems be completely revolutionized.

A NOVEL CANDLESTICK.—The make an unusual kind of candlestick insert an iron nail in the lower end of a short candle in order to make that end heavier and place the whole in a glass containing enough water to reach the upper edge of the candle without wetting the wick. As the candle hurns it grows lighter and lighter and rises gradually as it diminishes in length, so that the lighted end always remains above the surface of the water. Moreover, the outside of the candle heing cooled off will melt much more slowly than usual and the flame will make a little hollow in the center. This hollow place also helps in making the candle float and preserves the wick from the water. Thus the candle will continue to burn until the wick is consumed.

THE FEEDING OF INFANTS.—In France the Society for the Protection of Children has prevailed upon the government to enact stringent laws for the feeding of infants, making it an offense to give solid food to a child under a year old. Such food may he given, however, hy the prescription of a licensed practitioner. The use of nursing hottles with rubber tuhes is also forbidden hy law. When the tube is used it should he turned inside out after each using, thoroughly washed, rinsed and dried, then put in water containing a little baking soda. Once or twice a week the tuhes should he boiled a few minutes.

A GOOD imitation of ground glass can he made by putting a piece of putty in muslin and twisting the fabric tight into a pad; clean the glass first, then treat with the putty all over. The putty will exude sufficiently the muslin to render the stain opaque. Let it dry hard and varnish. If a pattern is required, cut it out in paper as a stencil, place it so as not to slip and proceed as above, removing the stencil when finished. If there should he any objection to the existence of the clear spaces cover it with a light opaque varnish. In this way very neat and cheap designs may he painted on glass doors.

PLATINUM vessels for concentrating acids are now made on an improved plan, the new feature heing that of coating the platinum with gold, such a coating, it is found, adding materially to the life of the vessel. The coating of the platinum sheets in this manner is accomplished hy simply heating them to a temperature higher than that of the melting point of gold, and then running the molten gold over them. The douhle sheet of the two metals can then be rolled, when it is fit for making the vessels that are required for chemical lahoratories and other purposes.

IN GERMANY, the smith, when finishing the shoe, punches a hole in the two ends, and when the shoe is cold, he taps in a screw thread and screws into the shoe when on the horse's foot, a sharp-pointed stud of an inch in length; and with shoes thus fitted, horses can travel securely over the worst possible road, and have never been known to slip, and draught horses are shod in the same way.

IT appears that a colored or dark pigment in the olfactory regions is essential to perfect smell. In cases where animals are pure white, they are usually totally devoid of hoth smell and taste; and some, the white cat, for instance, are almost invariably deaf.

THAT which is popularly known as the funny hone, just at the point of the elhow, is in reality not a bone at all, hut a nerve which lies near the surface, and which, on getting a knock or blow, causes the well-known tingling sensation in the arms and fingers.

THE points of the compass can be told from trees by the following simple observations: The side of the trees on which most of the moss is found is the north. If the tree be exposed to the sun the heaviest and longest limbs will he on the south side.

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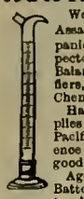

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Electricity.

The Rise of the Storage Battery.

A report of an extended trial of the storage battery in Milford, Mass., presents facts indicating that this ideal method of propulsion is far on the way to practical success, says the Pittsburg *Dispatch*. The drawbacks of the trolly make the subject one of undoubted interest to all cities where electric transit is required. Storage-battery cars have been in operation at Milford for 16 months. During that time there has not been a single day's failure of the line in summer or winter. Six miles of track are run over, including grades of 8½ and 10 per cent, and in all cases the power has been adequate to surmounting these grades at an even rate of speed.

The improved storage-battery car weighs less than the trolley cars used in Boston. They carry power enough to run long distances, one car having run 50 miles without recharging with a surplus of power at the end of the run. This is partially due to the fact that the action of the wheels in running down grades is used to recharge the batteries, an exact record of one trip showing that 17 per cent of the power from the batteries was returned by this method in going down hill. The storage cells are constructed of rubber in such a way that the "buckling" of plates, which was wont to disable the older style of battery, does not take place. The batteries are charged at the terminal station in a very few minutes.

Beyond the great achievements of doing away with the trolley poles and wires, the advantages are quite positive. An accident cannot bring the whole line to a sudden stop. The electric lamps in the cars are not extinguished, as in the trolley cars, when the trolley is thrown off the wire. The whizzing souod of the trolley car is asserted to be abolished. Electrical buttoos ring signals, which in other cars are sounded by bell ropes. But the great advantage of the storage-battery, if these reports are not overdrawn, will be its abolition of overhead poles and wires. That is something that should be done as soon as the practicability of the storage-battery is completely demonstrated. The poles and wires are an endurable nuisaoce so long as they are necessary to improve transit, and oo longer. If the reports from the road at Milford are not exaggerated the day is not far distant when they can be completely abolished.

ELECTRIC LOCOMOTIVES. — There are are very few installations to-day where electric locomotives drawiog passenger trains are in use, and fewer still from which the actual figures and reliable data can be obtained regarding the details of operation. For this reason the results of actual working of the Siemens electric locomotives on the underground line of the City & South Loodon railway will prove of great interest to electric-railway engineers and others interested in this method of rapid transit. The figures presented by Mr. Alexaoder Siemens show that, with these locomotives of 100-horsepower capacity, the efficiency of the motors, under widely varying conditions, was practically constant at about 92 per cent. The armature speed to secure these results was varied from what would correspond to 12 miles per hour of the locomotive to about 30 miles per hour, and the brake horsepower under these different speeds was 110 and 49-horsepower respectively. After being put into actual service, the locomotives were thoroughly tested, the average speed heing about 13 miles per hour. A study of the curves shows that each locomotive, which fully equipped weighs not far from 13½ tons, when drawing a load of 21 tons exclusive of passengers, required under ordinary running a current of not over 50 amperes, although in starting as much as 140 amperes were used. The violent fluctuations of current called for are shown as in all curves of this kind that have ever heen published, aod, as might have been expected, the fluctuations of voltage at the geoerating station are shown to he not coincident with the fluctuations at the terminals of either one of the locomotives.—Electrical World.

WROUGHT AND CAST IRON FOR DYNAMOS.—Two very important considerations influencing the construction of field-magnets are economy and mechanical strength, and in practice it is often considered advisable where the weight is unimportant to use cast iron for part or all of the field-magnet core. It is preferable to forge or cast the core in one piece, as joints break the molecular continuity and increase the magnetic resistance considerahly; this disadvantsge is minimized hy making the surfaces in contact fit truly. The principal practical objection to the use of cast iron is that, since its sectional area must be at least twice that of wrought iron, a much greater amount of copper is required to form the field-magnet coils. Copper is expensive, while cast-iron cores are far less costly than equivalent ones of wrought iron, and it is interesting to observe how different makers aim at true economy in this matter. Even leaving out the question of cost and weight, it does not by any means follow (as is sometimes supposed) that a dynamo properly designed to perform certain work, and having cast iron in its construction, is inferior to one built wholly of wrought iron to perform the same work.—Electrical Age.

Electric Power.

Only a portion of the power given electrically to a motor, says the *Electrical Age*, is converted usefully into mechanical power, a part heing spent in heating the armature, field-magnet, coils, etc. When the armature is at rest, the whole of the electrical power absorhed by the motor is so converted ioto heat, and the efficiency of the machine—that is, the ratio of the useful power obtained on the shaft to the total power supplied—is at its lowest value. When the armature is moved, the useful performance of work hegins, and as the current also falls in strength, the power wasted in heating decreases. The higher the speed of rotation the higher becomes the counter-E. M. F., and the less becomes the power wasted as heat in the conductors; in fact, the ratio of the power usefully absorbed hy the motor to the whole power supplied is very nearly proportional to the ratio of the counter-E. M. F. to the E. M. F. applied at the terminals of the machine. The efficiency of the machine is therefore highest when the load is a minimum—that is, when it is doing least work per revolution—while the torque, or the force with which the armature tends to rotate, is greatest when the load is sufficiently great to prevent the armature turning, and when, therefore, it is doing no external work at all. Now, when a motor is running at a high speed, it performs very little work indeed duriog one revolution, although, the number of revolutions heing great, a considerable amount of work may be performed during a given interval of time—say one minute. Oo the other hand, when the speed is very low, the amount of work per revolution is comparatively great, hut the small number of revolutions per minute prevents the quantity of work reaching, during that interval, a very high value. By considering these two extreme cases, it might be supposed that there is a certain intermediate speed of rotation at which the work performed hy any given motor is a maximum. This is the case, and the speed of a motor at which it can perform the maximum amount of work per minute is that speed at which the counter-electromotive force becomes equal to the electromotive force applied at the terminals. This result is quite independent of the efficiency of the conversion, which iocreases with the speed of rotation.

ANNUAL MEETING.

The Regular Annual Meeting of the Stockholders of the Pacific Coast Borax Company will he held at the office of the Company, Room 26, No. 101 Sansome St, San Francisco, Cal, on Monday, the 19th day of September, 1892, at the hour of 1:30 o'clock, P. M., for the purpose of electing a Board of Directors to serva for the ensuing year, and the transaction of such other business as may come hefore the meeting.

ALTON H. CLOUGH, Secretary.

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Assessment Notices.

NOTICE OF ASSESSMENT.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Amador City, Amador County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of August, 1892, an assessment, (No. 3) of One Dollar ($1) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room 43, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 18th day of October, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. H. ISHAM, Secretary.

Office—No. 310 Pine Street, Room 43, San Francisco, California.

DELINQUENT SALE NOTICE.

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Notice—There is delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 28th day of July, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
S N Maxcy, Trustee	112	150	$15 00
R T Hayes	54	37	3 70
O M Blanchard	55	37	3 70
T Frank Jones	59	200	20 00
T Frank Jones	80	200	20 00
T Frank Jones	245	600	60 00
T Frank Jones	252	125	12 50
R S Maxcy	71	1000	100 00
R S Maxcy	72	1000	100 00
R S Maxcy	73	1000	100 00
R S Maxcy	74	950	95 00
E C Wood	62	300	30 00
E C Wood	111	475	47 50
Adelaide Loring	77	825	82 50
L A Wade	78	600	6 i 00
L A Wade	153	200	20 00
L A Wade	162	500	50 00
John F Marr	92	10	1 00
John F Marr	288	40	4 00
Sylvester Marr	93	500	50 00
Sylvester Marr	299	500	50 00
O O Boyd	94	500	50 00
O G Boyd	246	500	50 00
Jno C Small	167	566	56 60
Geo Trefethen	99	500	50 00
Geo Trefethen	266	100	10 00
Samuel B Kelsey	104	50	5 00
Samuel B Kelsey	105	50	5 00
Samuel B Kelsey	106	50	5 00
Samuel B Kelsey	107	50	5 00
Samuel B Kelsey	108	50	5 00
Samuel B Kelsey	109	250	25 00
Samuel B Kelsey	237	1000	10 i 00
Samuel B Kelsey	251	125	12 50
Samuel B Kelsey	253	100	10 00
N H Wood	110	200	20 00
Henay Loring, Estate of	129	350	35 00
C H Leighton	151	200	20 00
C H Leighton	244	1 0	10 00
P B Rolfe	163	500	50 00
Peter Orant	159	500	50 00
Peter Orant	160	500	50 00
Peter Grant	185	300	30 00
Peter Orant	186	233	22 80
D H Bartlett	166	500	50 00
D H Bartlett	250	50	5 00
John Tebbets	178	100	10 00
John Tebbets	181	100	10 0
John Tebbets	183	2 0	20 00
John Tebbets	184	300	30 00
John Tebbets	221	125	12 50
John Tebbets	267	250	25 00
John Tebbets	268	400	40 00
C W Rolfe	180	200	20 00
James Wheeler, Trustee	197	2500	250 00
W T Oarratt	204	67	6 70
Fred B Kelsey	238	250	25 00
Fred H King	239	250	25 00
A K P Leighton	240	250	25 00
Edward Fletcher	241	250	25 00
Mrs X John Little	142	250	25 00
Mrs Mary F Wede	243	250	25 00

And in accordance with law, so many shares of each parcel of stock as may be necessary, will be sold, at the office of the Company, on MONDAY, the 26th day September, 1892, at two o'clock in the afternoon of such day, to pay said delinquant assessments thereon, together with costs of advertising and expenses of sale.

ROBERT McF. DOBLE, Secretary.

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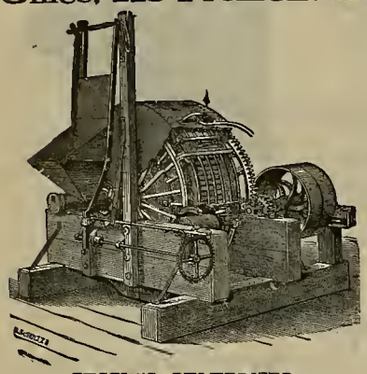

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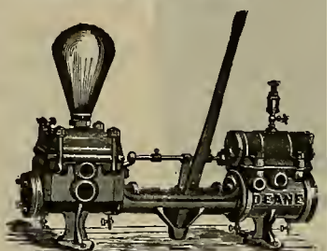

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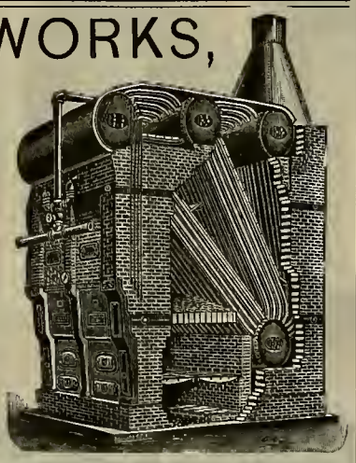

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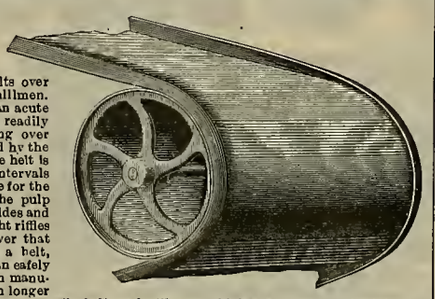

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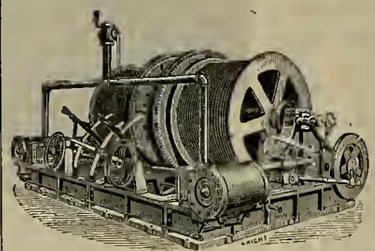

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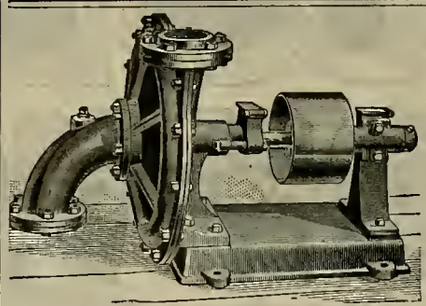

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

QUARTZ MOUNTAIN MINE.—Amador *Record*, Sept. 8: Recently, a *Record* reporter, in company with Foreman Wm. Ford, went through the first level of the Quartz Mountain mine. There is a 12-foot ledge that averages $7 or $8 per ton, and the sulphurets, with which the rock is well charged, assays from $500 to $800 a ton. The ledge in the northern drift, which is in 160 feet, is being reserved for future operation. In the face of this drift the ledge is five feet thick and looks well. A chute is being opened out on the 12-foot ledge from the first to the second levels, a distance of 132 feet. This chute will greatly facilitate the handling of the ore from the first level. We are assured that the mine throughout never before gave such encouraging promise as at present. Supt. Farwell returned last Saturday from San Francisco, and he expects to soon make some important improvements about the mine that will largely decrease the operating expenses.

IAMA.—The Irma Gold Mining Co. has already got the old Pioneer shaft pumped out, and has started drifting west to the Griesback ledge. A steam hoist, air compressor and machine drills are on the way from San Francisco, and will be in place soon. This will insure lively times on the creek—indeed, more lively than have been for the last 30 years. David Guttman was the promoter of the company.

AMADOR CITY.—The mines in and surrounding Amador have not looked so well in many months past as they do at the present time. Quartz mountain has opened up a rich vein, which promises well. A piece of the rock was shown us, and it contained considerable free gold visible to the naked eye. A. B. Call informed us, Monday, that the Gover mine was looking much better, and that they felt much encouraged over the prospects. The mill started up last week Monday. The Keystone and South Spring Hill mines are looking well. Some people here are prophesying that the Bunker Hill mine will resume operations before Christmas.

THE HECTOR.—Amador *Record*, Sept. 1: It may be of interest to the public to know something regarding the action of the citizens' committee appointed to investigate the blow-up perpetrated by some dynamite fiend or fiends at the Hector mine last May. That committee has obtained some very important clues as to who committed the act. In fact, we are informed that the committee is pretty thoroughly convinced on that score. In justice to Josiah Phillips, we will say that both the management of the mine and the committee are satisfied that he had no hand in the dastardly deed.

Butte.

PROSPEROUS MINES.—Oroville *Register*, Sept. 8: On Sunday, N. Goldstein, Henry Wise, H. D. Lausen and Charley Bills visited Bangor and inspected the mines. From Mr. Goldstein we gather the following particulars: There are three companies at work, the Catskill, Bishop and the Hay & Clark; the former employs 41 men, the second eight men at present and the latter 51 men. The Catskill owners are putting in new steam machinery and are sinking a new and large shaft. They have had but one arrastre at work but soon will have three; Hay & Clark have 15 stamps in operation and are now adding five more. There are four new companies sinking on the blue lead, one of them being a Gridley company and another a Marysville company in which Senator Berry and some Sutter county people are interested. Mr. Goldstein and his party visited the mines and went down into the shafts; in places the blue gravel fairly sparkled with gold. They talked with some of the old Grass Valley miners who are working there and the men said the mines were as good as any they had seen in the State. From one arrastre in six days the Catskill Co. obtained over $2500, or over $400 a day. They visited the Mansfield mine, near Wyandotte, and the men working there said they thought they would not have to go more than ten feet farther to strike blue gravel and find rich pay.

RICH GRAVEL.—Oroville *Mercury*, Sept. 7: H. G. Greiner, proprietor of Recreation Park near Chico, returned yesterday from a prospecting trip in the vicinity of Buck's Ranch. He mined there in early days and knows the country. On this trip he found a gravel deposit which proved very rich in coarse gold. He has located the mine and thinks that he will be able to thoroughly develop it next season. He took out about $20 from a small amount of gravel and it is a fine quality of gold.

El Dorado.

GENTLE ANNIE.—Placerville *Democrat*, Sept. 10: The Gentle Annie mine, under the superintendency of Ben Parlow, is to-day one of the best mines in the county. They have recently erected a hoisting plant and, with their dozen of employes, the place presents a business-like appearance.

Kern.

THE CYANIDE PROCESS.—Bakersfield *Californian*, Sept. 7: The Bright Star M. Co., located on Piute mountain, has several thousand tons of tailings, all of which carry some gold. When the mill was in operation, owing to the scarcity of water, all the tailings were run into slime vats from which the water was pumped back for use in the mill again. Consequently all of the gold that was not saved by the first treatment in the stampmill yet remains in the tailings, as they were not allowed to run away. A few weeks since Don Palmer of St. Louis and Col. Parke of San Francisco, leading representatives of the company, made a trip to the mines and took careful samples of the entire pile of tailings, which were sent to Denver for assay and subsequent treatment by the MacArthur process. The results proved so satisfactory that it was decided to make tests upon a working scale. Consequently five tons of the tailings were sacked and hauled to Caliente by N. T. Williams and Isaac Johns for shipment to Denver. If this practical working test proves satisfactory, the cyanide process will be introduced at Piute next season. At Havilah, a Mr. Stebbins has leased the Reese mill on Clear creek, near the mouth of Copperas creek, and is putting in tanks preparatory to the use of this process on the gold ores of that camp. If this method of dissolving gold by a weak solution of cyanide of potassium proves successful in Havilah, it will be of immense advantage to the mining interests of that locality, for there is an immense amount of low-grade gold ore there in which the gold is finer than flour and practically unobtainable by the usual methods of amalgamation.

Humboldt.

HUMBOLDT OIL LAND CO.—*Western Watchman*, Sept. 10: A meeting of the Board of Directors of the Humboldt Oil Land Co. was held at the office of the secretary, John O'Neil, on Monday afternoon last. The Board organized by electing Jas. Simpson, Pres.; S. F. Pine, Vice-Pres.; Dan Murphy, Treas. For the present, John O'Neil will remain as acting secretary. The Board, as elected at the recent annual meeting, is composed of the following named gentlemen: Jas. Simpson, S. F. Pine, Dan Murphy, E. May and Dr. R. Gross. The meeting of Monday resolved on prosecuting the work with renewed energy, and has adopted a more vigorous system of pushing the work. On Monday next, Pres. Simpson and Director May will start for Garberville in order to make personal examination and to thoroughly understand the present condition and prospects of the work. The well has been allowed to remain unmolested since the drill was disabled, with a view to ascertain what amount of oil may now be coming into the well from seepages. It is the intention of the directors to push the work with a greater degree of speed than ever before. The history given by the superintendent of the nature of the formations passed through, and the indications now reached, were in the highest degree encouraging, and the company proposes to "get there" at the earliest possible moment. The conditions of this well are far more promising than those attending the operations at Mattole, as at East Branch we have good, firm, regular and unbroken sandrock formation, interspersed with hard strata, and over one thousand feet of the well are standing firm and solid, without piping, while the Mattole well has caved so badly that they had to leave their tools buried in the bottom and select a new location. Everything presages an early and successful finish of the East Branch well.

Modoc.

GOOD ORE.—Alturas *Herald*, Sept. 10: If any one thinks we have no mines here let him come and see the piles of ore heaped upon the hillsides near Barnes and Robinett farms. Mr. J. H. Cowan is getting out some good ore from the Robinett mine, while higher up the men working the Sexton & Bush mine are getting quite a huge dump at the mouth of their claim. The Glidden & Asber claim is not being worked at present, owing to harvest season. The Mills & Moss mine is also laid by for a while. Messrs. Boggs & Henderson did some work some days ago on their claim and at a few feet below the surface struck some rich-looking ore. All the claims will be worked more or less after harvest is over.

Nevada.

PROVIDENCE.—*Herald*, Sept. 10: A great deal of work has been done at the Providence mine during the past ten months, and upward of $50,000 has been spent. Over 1200 feet of shaft has been retimbered, 1400 feet of new track rails laid, the old workings cleaned out and a level has been driven nearly 500 feet. The company mapped out a big job, and it has carried it through thus far in good shape. It is quite an enterprise.

STRUCK IT RICH.—*Transcript*, Sept. 10: The Delbi mine, near Columbia Hill, has, for some time, been under a very dark cloud, but now all is bright there again. On Tuesday last a two and one-half foot ledge was struck 30 feet below the lowest tunnel. The rock will go at least $30 per ton, and there is lots of it in sight. Chris. Mallon, the superintendent, brought some of the rock here and it looks fine. Dividends will be in order soon from this grand old mine.

WYOMING MINE.—Grass Valley *Telegraph*, Sept. 10: Saturday afternoon, a good strike was made in the Wyoming mine, in south Grass Valley. In the bottom of the shaft, 165 feet down, the ledge is highly mineralized and shows well in free gold. The ledge is from 8 to 18 inches thick at that point. Samples of this very healthy ore can be seen at the store of Parsons & Quick, on Main street.

THE SEVEN-THIRTY MINE. — Grass Valley *Telegraph*, Sept. 7: The Bowery and Seven-Thirty quartz mines, now owned by the Evening Star Mining Co., will, from present appearances, start up in a short time. Superintendent Taylor, who is one of the most experienced miners on the coast, having operated both on the Comstock and in Amador county, has purchased a fine plant, which is now being placed on this famous claim. As is well known in this community, the ore from this claim has been of about as high a grade as was ever known in this district, most of it running above $100 per ton. The property has been tied up for a long time by litigation, which is now finally settled. As a matter of fact, the Bowery and Seven-Thirty (now consolidated) is one of those claims that has never failed to respond to the hopes of the prospector, no matter how worked. It has a right to be termed one of the luckiest gold mines in Grass Valley district, and this notwithstanding the fact that it has never been systematically worked in the modern sense of the term. From the preparations being made, the claim will be thoroughly prospected according to modern methods. We expect to hear great things of the Bowery and Seven-Thirty at an early date. 150 feet lower, which will give him plenty of stoping for some time. Peter Larcine made some new locations recently that prospect well. He sold one the other day for $100. Colgrove of the Excelsior mine will soon have ont another run of good ore. Smith B. Brooks, who has staved with the Mary Blain mine, is driving a tunnel to tap the ledge. He ran an incline on the ledge until stopped hy water. The ledge prospects well. Geo. Roff has made a discovery near Cecilville, on the South Fork of Salmon, where he panned out $50 in one day. It is reported that he has been offered $10,000 for it. Gus Dannenbrink passed through here on his way to Weaver and reports everything flourishing on Know Nothing. He thinks the new process of working base ores a success.

Shasta.

RICH STRIKE ON SALT CREEK.—*Free Press*, Sept. 10: Recently E. P. Connor, the boss prospector of Shasta county, bought the Kempton mine on Salt creek for $100. He and his son immediately began work on the old tunnel, which is in 100 feet. This tunnel work was commenced in July. At the same time he commenced sinking a shaft to connect with the tunnel about 150 feet from the surface. At a depth of seven feet he took out during the past week several washtubs full of gold quartz. In one pan there was $1000 worth of gold. During the week about $7000 has been taken ont, and they are still in rich ore. On the spot where the shaft was put down was an old block on which former owners of the ground had cut their fuel. These wonderful strikes occur in Shasta county every little while, but nothing before for a long time has quite equaled this strike so near the surface. Miners are used to wonderful sights, but the quartz now exhibited at the bank by Mr. Connor excites all who see it. Mr. Connor offered this property last Saturday for $4000, which was refused.

BONNAN. — The old Washington mine at French Gulch has been bonded to San Francisco parties, who will proceed at once in the work of development. One of the owners of the Mammoth mine arrived this week, and we learn that the development of the mine and erection of a mill will take place right away. Arnold Becher, representing a rich syndicate, has made a payment of $3000 on the bond for the Quartz Hill property owned by Harrison, Lyons and Meeks. Exceedingly rich ore and a rich ledge has been discovered at the bottom of their 118-foot shaft. Becher means business and will no doubt develop a good property. The Greene mine on Deadwood, known as the Queen of Diamonds, which not long since became the property of the bank, has been bonded to San Francisco parties, who have ten men employed in opening up the property, on which they will erect a ten-stamp mill. Under Green's management the mine yielded many thousands of dollars, but finally appeared to be exhausted. Many believe, however, that there is still a large quantity of good ore hidden. It will take some little time to open up the tunnels.

Siskiyou.

GOOD RETURNS.—Yreka *Journal*, Sept. 14: The Spencer quartz mine on Humbug still continues to yield good returns The Boyle claim on the same creek, at head of North Fork, is also yielding good returns, and a rich vein has lately been found which promises to prove still better than any of the quartz yet taken out. The owners of the blue gravel claims on Greenhorn, near the Scott valley stage road, will soon commence an effort to reach the pay streak again, now that the bedrock water is getting lighter in volume to be handled by the steam pump. This is one of the richest claims in the county, but contains a great amount of water between the cement hardpan and the foundation bedrock below it, as well as rich blue gravel. The Golden Gate Co., engaged in tunneling the mountain west of Yreka, has excavated about 180 feet, but get along very slow lately, the bedrock containing considerable iron, with the supply of water gradually increasing.

Trinity.

NEW RIVER.—Cor. Trinity *Journal*, Sept. 10: J. C. Leas and Thos. Nichols of the Sherwood mine made a clean-up on the 23d of last month of nearly $4000 from 73 tons of ore. They expect to have another run in about a month or six weeks. Jas. Gulick has out quite a lot of ore from the Uncle Sam mine. Mr. Sherwood is running a lower tunnel to tap his mine some

NEVADA.

Washoe District.

CONS. CAL. & VIRGINIA.—*Chronicle*, Sept. 10: 1800 level: Along the south end of the drift running south from the crosscut run east from the winze No. 1 sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. From the crosscut run east from the bottom of winze No. 2, down 45 feet, at a point 20 feet east from the winze, the drift has been advanced 25 feet; total length, 68 feet; in a quartz formation, from which a few tons of milling ore has been saved. Are putting in square sets of timbers in this south drift preparatory to stoping. There has been extracted from all parts of the mine during the week 992 1910-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $25.57 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $22.52 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $11,199.31.

MEXICAN.—On the 1465 level, the west crosscut, which was started from the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, has been advanced 13 feet; total length, 67 feet, continuing in porphyry and clay.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift has been extended during the week 21 feet; total length west from the joint shaft, 2395 feet. The face is in soft porphyry.

UTAH.—340 level: From the end of the north drift (at a point 432 feet in) from the west crosscut from the shaft station, west crosscut No. 2 has been extended 21 feet; total length, 264 feet, continuing in porphyry, clay and quartz formation.

SIERRA NEVADA.—The Cedar Hill drift has a total length of 20 feet. The entire face is in quartz averaging $30 in gold. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 21 feet; total distance west of the shaft, 2395 feet; face in porphyry and small stringers of quartz.

ANDES.—On 420 level, have been repairing north drift from east crosscut No. 4. Tomorrow, work will have been resumed in east crosscut No. 1, north.

GOULD & CURRY.—During the week we have extracted 38 cars of ore from the old stopes on the 200 and 400 levels, the average car sample of which is $21 98. Shipped to the Occidental mill 122 tons; the average battery assay is $19.53. We have received bullion, the assay value of which is $1011.40.

BEST & BELCHER. — 900 level: The north drift from east crosscut, No. 1, has been extended 17 feet during the past week; total length, 137 feet; face in porphyry, clay and quartz. We have also done considerable repairing during the week.

HALE & NORCROSS.—We continue retimbering main shaft above the 1000 level. 1800 level: During the week advanced the north drift 20 feet; total length, 180 feet. Face in porphyry. The south drift on this level was advanced 25 feet; total length, 175 feet; face of the drift in porphyry.

CHOLLAR.—Are repairing north drifts on the 450 and 750 levels. The east crosscut, 160 feet south of north line, 930 level, is in 50 feet; face in porphyry.

POTOSI.—Are repairing the drift to the top of Lindsey winze, 350 level. Raise from No. 1 crosscut, 1100, is up 12 ft.; in the top there is 18 inches of $20 ore. Are opening a station on the 1850 level in Potosi winze, which is now in 22 feet from the footwall; face in porphyry and low-grade quartz. Are extracting ore from the 550, 950, 1100, 1150 and 1300 levels. Extracted and sent to the mill the last week, 339 600-2000 tons of ore. Worked during the week, 340 tons. On hand at mill, 79 600-2000 tons; average battery assays, $26.50; average car sample assays, $30.90. Shipped to Carson Mint 9234 pounds crude bullion.

BULLION.—The upraise from the east crosscut, 320 feet south of north line, 1300 level, is up 52 feet; top in porphyry and low-grade quartz. Are opening a station on the 1850 level in the Potosi winze, which is now in 22 feet from the footwall; face in porphyry and low-grade quartz. The northwest drift from the 1800 station, Ward, shaft is out 970 feet; face in porphyry.

ALPHA.— The joint west crosscut on our north line from 1800 level of the Ward shaft, is out 14 feet; the face is in porphyry and small stringers of quarz.

EXCHEQUER.—The joint west crosscut on the south line from 1800 level of Ward shaft, is ont 14 feet; the face is in porphyry and small stringers of quartz.

WARD SHAFT.— The joint Alpha and Exchequer west crosscut, 1800 level, is out 14 feet; face in porphyry and small stringers of quartz. The joint Potosi and Bullion northwest drift, 1800 level, is out 816 feet. The face is in hard porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels have extracted and milled 175 tons of ore of the average assay value of $19.10 per ton as per battery samples. Have extended the main north drift, 750 level, 8 feet; total distance from winze station, 472 feet. The face is in quartz of some value. The Zadig drift, Sutro tunnel level, has been extended 21 feet; face in porphyry formation; total length of main drift, 635 feet; total length of cross drift, 211 feet.

NEW YORK.—The north and south drifts from the winze 50 feet below the 630 level are each out 10 feet; face in both drifts are in fair ore. Car samples assay from $30 to $40.

Eureka District.

ORE SHIPMENTS.—*Sentinel*, Sept. 10: During the month of August the Eureka and Palisade Railroad Co. received for shipment to Salt Lake City and other points 1741 tons of ore from the following mines: From the Diamond mine, 841 tons; Eureka Con., 441; Jackson, 75; Alexandria, 63; Hamburg, 29; Bullwhacker, 29; Silver Connor, 27; Dunderberg, 19; Phenix, 15; Williamsburg, 15; Mstamoras, 13, and Lord Byron, 10. Total from Eureka district, 1741 tons.

White Pine District.

ORE.—Eureka *Sentinel*, Sept. 10: During the month of August the ore shipments from White Pine district were as follows: From Tom Cornell, 91 tons; Rock Kragnazo, 75; Paul, Ross & Co., 34; Ross & Siri, 26, and J. B. Mathewson, 11. Total from White Pine district, 237 tons.

El Dorado Canyon District.

PLACERS.—Dayton *Times*, Sept. 10: For the past few weeks the new placer locations at the head of El Dorado canyon, about 20 miles from Dayton, have been the subject of a good deal of talk. Raycraft Bros., of Carson, are the pioneers in the new mining region, and there-

fore have the best locations. The canyon is now located for a distance of five miles. The great difficulty to overcome is the want of water. All the lakes and springs in the neighborhood have been located, and ditches are now being dug to carry water to the claims. The ditch will be three or four miles long. With plenty of water it is expected that $100 a day to the man can be made. As it is, those at work make wages. As high as $1 a pan is frequently taken out. The gold is coarse. One nugget has been taken out that was worth $20, and another one worth $12. The mines can be worked only about six months in the year, as the snow makes all operations in the winter impossible. The placer ground is all the way from five to six feet deep to bed rock and pays all the way.

Ferguson District.

GOLD PROPERTIES.—Candelaria *Bell*, Sept. 10: People who assert that the State of Nevada will continue to retrograde forget Lincoln county with its newly-discovered gold mines. In the old town of Pioche, and also in Ferguson district, general prosperity prevails. In the last-named, important sales of gold properties have recently taken place, a couple of thrifty camps have been established, and if we may credit reports, a second Leadville is liable to spring up in a few months, as if by magic, in the southeast corner of the State.

A BIG MINING SALE.—Pioche *Record*, Sept. 8: James Mahana, who went through to Ferguson district last week to consummate his purchase of the April Fool group of mines, was accompanied by A. A. McMasters, a mining man of large experience, and who is also interested in the purchase. Friday evening the two gentlemen returned here, accompanied by Messrs. Reeves, Ellis and Wilson, owners of the claims, and the day following, Saturday, the necessary papers in the matter were drawn up, and are now on file in the county recorder's office. The properties embraced in the detail are the April Fool, Princess, Jumbo, Dublin, Lookout, Monitor, Cliff, Monitor No. 2, three-fifths of the Swifter and three-fourths of the Millionaire, and the consideration to be paid is $150,000. John B. Farish, A. A. McMasters James Mahana and R. C. Chambers are the purchasers, who pay something over $1000 down for the mining and other supplies now on hand at the mines, and are to pay $50,000 within 60 days from Sept. 6th, and $100,000 within four months thereafter. The purchasers are to take possession of the claims and work and develop during all of their said time, one or more of the claims, and after the first day of October are to work not less than ten men. No ore is to be moved from the premises, except for assaying purposes, until all the purchase price is paid. The sellers, Reeves, Ellis and Wilson, are to have all ores now extracted, and have 30 days in which to remove the same. The value of the ores now on the dump is estimated at from $7000 to $10,000. The purchasers are to secure the properties against any liens for wages or other claims. Mr. McMasters returned immediately to the mines and assumed charge, while Mr. Mahan returned to Salt Lake to make provision for immediate work. This deal is the largest which has taken place in this section since the palmy days of Pioche, and the properties in every respect are said to justify the price to be paid, as they are the cream of the district. With active work on these properties, and a continuance of present operations on the Magnolia, the other rich mine of this district, the next 60 days will determine whether Ferguson is to come before the mining world with a boom or by only a gradual development of its resources.

Freiburg District.

SILVER AND LEAD.—Pioche *Record*, Sept. 7: J. W. Reed and Lewis Sharp brought in yesterday two tons of ore which will run 60 ounces silver per ton, and carries 50 per cent lead. They dispose of the ore at the smelters here. The ore is from the Bull of the Woods claim, a recent location. Four feet of ore of this character is exposed and will be mined and marketed here forthwith.

Tuscarora District.

NORTH BELLE ISLE.—No. 1 north drift, south 300-foot level, extended 9 feet. The vein is looking better.

NORTH COMMONWEALTH.—Extracted 5 tons of ore, some of it being very high grade. Have on hand about 40 tons of concentrates, assaying $224 per ton.

BELLE ISLE.—South drift, 250-foot level, extended 8 feet, and a stope has been started on the ore. The upraise, same level, has been extended 5 feet; rock not so hard and vein looking better.

NEVADA QUEEN.—Extracted 30 tons first-class ore assaying $260 per ton, and 383 cars second-class, battery assay $26 per ton. Received from Union mill on account of ore sold $9000.

COMMONWEALTH.—Stopes from the east line drift show an improvement since last report; ore is better grade. East drift from No. 3 chute advanced 19 feet; still in vein giving low assays. Third level stopes about the same, yielding ore assaying $28 per ton. Hoisted 8 cars first-class ore, $220 per ton, and 171 cars second-class sent to concentrating plant, battery assay $26 per ton.

ARIZONA.

WHITE HILLS.—Mohave *Miner*, Sept. 10: Encouraging reports are received from the new mining camp of White Hills, and the prospects of a thriving mining section are very promising indeed. We are informed by reliable and experienced mining men that the mines never looked so well as they do at present. Nearly all the properties being worked are showing up to advantage as depth and development work progresses. It is true that proper facilities for working the mines in a systematic manner are in an unsettled condition as yet, but time and capital will shortly remedy this drawback and put the properties on a secure paying basis. The day has gone by when capital can be induced to invest two or three hundred thousand dollars on a prospect hole five or six feet deep with indications of poverty and delirium tremens in the bottom of the shaft. Capitalists want mines or the resemblance thereof. Mines of exceeding richness are to be seen in Indian Secret district, without doubt, and the outside States and Territories are aware of this fact, and capital is awaiting a favorable opportunity to invest. Every blow with the pick and every shot put into the ledge increases your chances of sale and enhances the value of your property. The mines at White Hills are improving with development. The Horn Silver, which had pinched out at a depth of about 30 feet, is now showing a fine vein of horn silver and chlorides. The Grand Army, at a depth of 60 feet, is in big ore. One shaft has a three-foot vein of chloride, with nuggets and globules of horn silver through the entire mass, the other shaft, 400 feet away on the same vein, showing 30 inches wide of ore equally rich, while some 400 feet east of this another shaft is being sunk with a foot of $1000 ore, which is gradually widening. The Prince Albert is being leased in 100-foot blocks. Very rich ore is found in all the workings.

MONTANA.

THE SMELTER.—Butte *Inter-Mountain*, Sept. 10: The new Butte & Boston smelter is fast approaching completion. It will be the model smelter-building of the West and when the engineroom is added will be 265 feet in length by 50 feet wide. There need be no fear that the that the present building will ever be destroyed by fire, for in the whole length and breadth of the works enough wood cannot be found to make a toothpick. The walls and sides are of corrugated iron, the rafters and upright columns being ribs of iron. The floors consist of sections of cast iron, and a locomotive could run over these sections without any danger of them breaking. The company is now figuring on some very extensive improvements to the smelter. It has been decided to add a converter process to the works, something similar to that at the Parrot, and for this purpose a 150-horsepower engine and a compressor have been ordered and will shortly arrive on the ground. This additional machinery will greatly increase the output of the smelter and will give employment to a great number of miners and smeltermen. At present operations at the works are progressing on nearly the same scale as before the fire. A few men are being put on at the mines each week as the capacity of the smelter increases, and in a week the properties of the company will be running in full blast.

CASTLE.—*Mining Journal*, Sept. 10: Walter J. King has just returned from Castle and brings good news from that camp. A force of men is being put on the Cumberland which will increase the number employed to 65 or 70 men. A hoist is being erected on the jumbo and when it is in order a force of men will be put to work on that mine. There is no news about a railroad. It was said that J. Kennedy Tod could give no assurance that a railroad from Great Falls would be started this year. A great discovery has been made on the Cumberland, a body of carbonate ore having been found above the 200-foot level, right near the first workings of the mine. It is estimated that there is more ore in this body than has been taken out of the mine up to this time. During the last run of the Cumberland smelter nearly $800,000 worth of bullion was produced.

PARK DISTRICT.—Mr. O. A. Southmayd, with Mr. Pascoe, a mining expert of Butte, visited the properties of the Goodyear M. Co. in Park district, Jefferson county, last week. Mr. Pascoe expressed himself as highly pleased with the properties of this company and adjoining claims, and was of the opinion that it is a rich mining country. The Goodyear Co. owns five claims which lie on both sides of Indian creek, and two claims one mile north, making seven claims and a millsite. The company is sinking on the Whopper shaft on the Jenny Lind lode. It is now down 130 feet, following a shoot of ore, the dimensions of which are unknown. Samples taken from across the shaft ran $38 in gold, 18 oz. of silver and 40 per cent lead. There are two leads on the Jenny Lind and it promises to be a good property.

OREGON.

ROAD TO THE MINES.—Eugene *Register*, Sept. 10: We can now state positively that we are to have a road to the Blue River mines, and that in a short time. George Larrison of Springfield, who has had a large amount of experience in building such roads, has been engaged to superintend the work, and it will be done by day labor instead of by contract. The road to be built will be about 15 miles long, and will extend from Pepiot's to the top of Gold Hill. The lowest bid for the construction of the road was $1760, so it will probably cost in the neighborhood of that amount.

WASHINGTON.

MEADOW CREEK MINES.—*Madre de Oro*, Sept. 10: The Meadow Creek mines, on the southwest of Lake Chelan, are attracting considerable attention. Several good strikes have been made lately showing both gold and silver, with silver predominating. There are about 50 miners now at work prospecting and developing these discoveries with satisfactory results. The first discoveries were made in May of this year.

PLACER MINING.—Placer mining on the Similkameen is once more coming to the front. E. A. Dolan, an old miner, was at our office this week with a pan of dirt which he washed out here, and got about 25 cents' worth of gold from it. He and his associates have located a placer claim four miles up the river, and will begin work at once on a current wheel to raise water on to the land for hydraulic mining.

Market Reports.

Local Markets.

SAN FRANCISCO, Sept. 15, 1892.

General trade the past week has been fair. The State and district fairs in this and adjoining States have been largely attended, which no doubt contributed to the dull spell. It is quite generally asserted that after the first rains, business in the rural districts will revive, while in the more mountainous sections, winter-stock buying will be largely stimulated. With foundrymen and ironworkers in general, there is a fair degree of activity. It is contended that if lower local freight charges ruled, the various manufacturing industries in this city would have all the business they could possibly handle. Railroad construction and railroad-surveying continue on an unexampled large plane. The latter, it is said, is a forerunner of increased railroad construction in the near future. The more general introduction of electricity as a motor-power in railroads, manufactures and mining appears to be creating a decided change for the better.

The local money market does not work close, which is contrary to the heretofore generally expressed belief of financiers. While there has been, and continues to be, a liberal call for funds against warehoused grain, yet there does not appear to be any difficulty met in securing reasonable accommodations without strengthening the views of lenders. The amount of money already tied up in warehoused grain is variously estimated at from $5,000,000 to $10,000,000. Remittances are said to be more free. As a rule, interior merchants have smaller accounts in this month than in the corresponding month for several years past.

The low price of silver, while against silver mining, appears to be stimulating the demand for gold mining propositions. So far as we are able to learn, there are more inquiries for gold mines than has obtained at any time within the past five years. The inquiry is not confined to this country, for we find foreign agents in the market for paying propositions.

Late mail advices from New York report the banks decreasing their reserve by freer loans and more liberal shipments to the cotton and grain-growing States. The most striking feature of the monthly financial reports of the Treasury is the large increase in the revenue compared with the same month last year. The total revenue for August was $34,032,928, against $28,884 851 for the same month last year. The Treasury owes no small part of its favorable balance at this time to the extraordinary imports this year and the large duties payable thereon. The net gold owned by the Treasury was only $3,711,925 greater than on August 1st, and the net silver owned in excess of certificates outstanding increased during the month $1,433,321.

In speculative securities, industrial stocks and railroad securities were, at last advices, receiving a fair degree of attention, notwithstanding the cholera scare, and the opinion was generally expressed that more active times were near at hand.

The result of the Treasury at Washington receiving $20,000,000 in gold coin from this city has been to lessen the export demand. The falling off is due to abrasion owing to the coin gaining a larger circulation on this coast. The old coin did not net the profit that the new coin did, owing to lighter weight. A New York exchange says that one of the large shippers, referring to the matter, says that a great deal of gold was very poor and the balance only middling. Before the California gold arrived this was not the case. Another shipper says that that his account sales show that the gold he shipped did not turn out as he had reason to expect, but inasmuch as he received a higher premium than some of the other shippers, he lost nothing by the operation.

Dows, Jones & Co. of New York have compiled a lengthy but very interesting and important table showing the changes that have occurred during the last four years in the relations of the United States Treasury to the finances of the country, from which it appears that the stock of gold coin and gold bullion in the Treasury has decreased $88,500,000. During the same time the money in circulation which the Treasury stands pledged to redeem in gold has increased $142,500,000. Four years ago the proportion of gold to the obligations to be redeemed in gold was 76.9 per cent. Now it is 42.3 per cent, a decrease of 43 per cent. This change is almost wholly due to the operation of the act of 1890 requiring the purchase of silver bullion and the issue against it of Treasury notes. The comparison shows but little change in the United States notes outstanding or in the gold certificates in circulation. The bulk of the gain has been in Treasury notes. There may be a question at some time in the future as to whether these notes, being a coin obligation, may not be redeemed in silver, but at present the Government is prepared to redeem them in gold, and recently delivered $1,000,000 in gold on presentation of $1,000,000 of Treasury notes. In receiving the gold obligations in circulation, we have not included silver dollars nor silver certificates. The silver in circulation has, however, increased in four years over $136½ millions. The total silver in circulation now amounts to $450 millions, secured by silver in the Treasury to the amount of 357¾ millions in standard dollars and 83½ millions in silver bullion, a total of about 441 millions.

Late advices report that nothing will probably be done by the Administration toward calling the International Monetary Conference until after the election, or, at least, until the deaths by cholera abroad show a very material decrease and the near future gives assurance of its being under control.

SILVER—The market has strengthened slightly the past week. The slow pace with which an advance of about one cent per ounce has been made shows there is not much life to the market, and that evidently the syndicate is feeling its way for future manipulation. With better-informed financiers there is a growing belief that the market value of the metal will sink considerably lower before the syndicate will be prepared for a long bull campaign. While giving expression to these opinions, yet they are firmly convinced that much higher prices will first obtain, which, it is said, will allow the marketing at a good round profit of the large quantities of securities and commodities whose market values are controlled by that of silver. It is now quite generally conceded that the monthly purchases of silver bullion by the Mint is in excess of the monthly output of the mines in this country.

MEXICAN DOLLARS—The market has been inactive but fairly firm at around 67¾ cts.

QUICKSILVER—Receipts the past week aggregate 332 flasks. The market is fairly active, with some shading on round parcels.

BORAX—Receipts the past week aggregate 1069 cts., and the exports by sea 2010 cts. to New York. The market is fairly steady. The low freight rates to the East are stimulating shipments.

LIME—Receipts the past week aggregate 5423 bbls. There is a continued free-shipping inquiry for the Hawaiian Islands. The home demand is said to be active. The market is quoted at $1.25 to $1.50 per bbl.

LEAD—The market is steady. Consumption this year shows a decided increase over the like time in last year. Eastern mail advices report a dull market with a poor support given either by consumers or speculators.

TIN—Receipts of pig from the Temescal mine appear to have fallen off very considerably, for the last consignment aggregated only 86 pigs. The market for both pig and slate is slow, with quotations largely nominal. London cables to *Iron Age* say that "Pig tin has been rather dull. Most speculators are awaiting action of the larger holders here and in America. Outsiders hold aloof. Visible supply has increased 574 tons during the month, all American. Business in tin plate generally has been trifling. Rather more doing in third-grade charcoals at 12s 9d in Swansea, but otherwise no improvement whatever is noticed. Stocks at Swansea now about 135 000 boxes, against 50,000 boxes a year ago. Considerable reduction has taken place during the past few days."

PIG IRON—The market is reported essentially unchanged. The consumption in this State and up north continues on a liberal scale. Late Philadelphia advices report plenty of pig iron to be had at the prices recently ruling, and the regular customers of the leading furnaces in this section have no difficulty in securing supplies at the old figures, but producers of the better grades of material are not inviting long-time contracts at present quotations.

COPPER—The market continues in an irregular and unsatisfactory condition, Eastern mail advices indicate a prospective lower range in values. Foreign cables report a soft market. To the cholera scare is largely attributed the prevailing dullness.

COAL—Imports the past week aggregate as follows: Newcastle (N. S. W.) 11,001 tons, Sydney 2567, Carmen Island 2100, Pioche Harbor 400, Nanaimo 7182, Coos Bay 450, Departure Bay 2407, Seattle 1000; total, 27,107 tons. The market continues unchanged. It is said that at times more or less cutting in prices is indulged in by importers. The consumption demand is disappointing, for the quantity taken is very considerably less than had been estimated.

San Francisco Metal and Coal Market.

ANTIMONY.			STEEL.		
Per lb	— @	13½	English, lb	— @	18
BORAX.			Cantou tool	— @	8½
Refined, in car lots	— @	7½	Bl'k Diam'd tool	8½@	15
Powdered, do	— @	7½	Pick & Hammer	7½@	10
Concentrat'd, do	— @	6½	Machinery	4 @	5
All grades in bbling at advance.			Foe Calk	— @	4½
COPPER.			TINPLATE		
Bolt	22 @	—	B. V. steel grade		
Sheathing	22 @	—	14x20, spot	—— @	5 87½
Ingot, jobbing	— @	14½	Charcoal, 14x20	— @	5 87½
Do, wholesale	— @	13½	Do roofing, 14x20	— @	5 87½
Fire Box Sheets	22 @	24	Do, do, 20x28	— @	11 75
IRON.			PIG TIN.		
Bar, base	— @	3	Spot ₩ lb	— @	22
Norway, base	— @	4½	COAL.		
PIG IRON.		Spot.	SPOT FROM YARD—PER TON.		
Eglinton ₩ ton	22 00@	—	Wellington		$8 00
Glengarnock	23 00@	—	Gretta		6 75
Am. Soft, No. 1	24 00@	—	Nanaimo		7 00
Oregon Pig	— @	—	Gilman		6 00
Puget Sound	— @	—	Seattle		6 50
Clay Lane White	24 00@	—	Coos Bay		5 50
Langloan	22 00@	—	Cannel		8 50
Thornoliffe	23 00@	—	Egg, hard		11 50
Gartsherrie	22 00@	—	Cumberland, in sacks		14 00
Barrow	22 00@	—	Do, bulk		13 00
Carnfeet	22 00@	—	Wallsend		7 00
CHROME IRON ORE.			Scotch Splint		7 00
Per ton	10 00 @	—	Brymbo		6 75
LEAD.			West Hartley		7 50
Pig	— @	4½	TO LOAD - PER TON.		
Bar	— @	5½	Australian		5 75@ —
Sheet	— @	7	Liverpool Steam		6 00@ —
Pipe	— @	6½	Scotch Splint		6 00@ —
SHOT.			Cardiff		6 25@ —
Drop, sizes *smaller* than B, ₩ bag of 25 lbs		$. 85	Lehigh Lump		12 00@ —
Do do, B and *larger* sizes ₩ bag of 25 lbs		2	Cumberland		9 00@ —
Buck, Balls and Chilled do, ₩ bag of 25 lbs		2 10	Egg, hard		10 00@ —
QUICKSILVER.			West Hartley		6 50@ —
Home trade, pr. flask		41 50 @42 00	COKE.		
For export		35 50 @36 00	English, to load		$8 00@ 9 00
			Do, spot, in bulk		—@10 00
			Do, in sacks		@12 00
			Cumberland		9 00@ —

Mining Share Market.

SAN FRANCISCO, Sept. 7, 1892.

The market for Comstock shares was quite active the past week under the leadership of Sierra Nevada in the north end group, Hale & Norcross in the middle group and Belcher in the Gold Hill group. Fluctuations in the quotations for the leaders ranged from 10 to 20 per cent. The rapid fluctuations combined with bull points and bull reports in the rings organs, have had a stimulating effect on the "mudhens" who are out in increased numbers trying to catch the turns. As yet the "gutter-snipes" are slow in catching at the bait, but there can be no doubt of their not being able to much longer resist the temptation. While the mines would unquestionably pay dividends provided the work of extracting and milling of ore was honestly conducted, yet the public should fight shy of the game which is afraid to conform to the law under which the companies incorporated. Until the law is conformed to the game will continue assessments for outsiders and bullion for insiders. Of course when the market is made active with lively fluctuations there are chances of making money, but when once drawn into the whirlpool it is almost an impossibility to withdraw and the victim at last sinks in the vortex of financial destruction, if not a physical wreck. It is a great game this, of working the Comstock mines and strewing the shores of time with financial, physical and moral wrecks.

The present movement in the Comstock shares is said to be due to a desire of the rings to placate their more pliant tool brokers, who appear to have sold themselves, body and soul, to do dirty work (giving proxies, etc.) for the inside. The business had dwindled to such small proportions that the brokers were not able to pay office expenses, besides which, the two exchanges had to levy assessments to meet current expenses. Whether the present move in shares will be a success remains to be seen. At this writing, it looks very much as if, in the end, it will prove a failure, and, if so, outsiders who bought at the higher prices will be heavy losers, besides, if they hold, being called on at stated times for assessments. It is a great game, this, of working the Comstock mines.

In dealing in Comstock shares, outsiders should not overlook several very important factors against much of a deal. In the first place, with the mines worked and the ore milled as at present, moneyed outsiders will not invest in the shares, for the developments in the Hale & Norcross suit are too fresh to be ignored. In the second place, without a complete reformation, but not through tools as insiders are now trying to do, in working the mines and milling ore, if shares are advanced two or three times above what they now are, to whom will the rings be able to sell? Former bull gudgeons are financially killed off, and with several millions shares in hand, it will be impossible to find buyers at very much higher prices. There are several large moneyed operators, knowing this to be the case, that stand ready to hammer the market when prices are advanced sufficiently to justify short selling. Then, again, the decision of the courts against margin-dealing makes brokers offish in carrying accounts except for tried patrons, and even for these the chances formerly run are not now taken. Evidently the rings, in their ghoulish selfishness, have killed the goose which laid the golden eggs.

It looks very much as if D O. Mills has instructed Bob Morrow to give the brokers a few crumbs by by sending the market up and at the same time, provided gudgeons are drawn in, sell the market down after the leading shares are advanced to certain figures. In selling the market down there must, to make it a success, be rallying points.

The street and newspaper organs are full of bull news from the Comstock mines. If present bull information does not draw in gudgeons, then more will be in order—some of which will be true, but the larger part will be made to order. The reported new (?) find in Sierra Nevada will, in time, be found to be in another company's ground, provided the rings meet with success in peddling out shares in that and adjoining mines. The new (?) developments in Belcher will aid in securing buyers for that and adjoining mines, and greatly aid the rings to collect the pending assessments on shares of Crown Point, Overman, Con. Imperial and shares of one or two other mines in that end of the lode. The diamond drill (which, by the way, has been in use for some time) is being used in Con. Virginia to help the market along. Work that has been under way for some time in several of the mines is being allowed to leak out, but the most important is still kept back. Probably it is just as well as long as the rings get the bullion. Until there is a genuine conformity to the law by the several mining companies, it is well to exercise caution in dealing in mining shares; the mines are one thing and the share market quite another.

The share market opened dull this morning and continued inactive up to the noon hour. The announcement of the levying of a 25-cent assessment by the Crown Point Company, with reports of other assessments pending, cools the ardor of outside dealers. As the ring evidently wants, or at least it looks so, to have outsiders pay the assessment, a small assessment was levied. It is in order now to induce holding and also buying to make active the shares of Belcher, Hale & Norcross, Sierra Nevada, and probably two or more other mines.

Eastern Metal Markets.

NEW YORK, Sept. 11.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38¾	83¼	11 25	4 10	20 27½
Friday	38¾	83¼	11 25	4 10	20 30
Saturday	38 3-15	83¼	11 25	4 10	20 30
Monday	38¾	83¼	11 25	4 10	20 30
Tuesday	38¾	83¾	11 25	4 05	20 25
Wednesday	38¾	83¾	11 25	4 05	20 20

Quicksilver is irregular and weak. Tin is inactive and in buyer's favor. Copper is weak, with a downward tendency. Lead is barely steady. In pig iron there is still more or less cutting.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 6, 1892.

481 927.—CABLE LOGGING MACHINE—J. Buckley, Eureka, Cal.

482,081.—ORCHARD CULTIVATOR—Daly & Neil, Covina, Cal

482 211.—SEPARATING SAND AND SLIMES—Geo. Gates Jackson, Cal.

482,123.—HISTORICAL TOY NOVELTY—F. C. J. Grebe, Los Angeles, Cal.

482,040.—SLACK TAKE-UP FOR AIR BRAKES, L. Guillemet, S. F.

482,125.—CAR COUPLING—G. C. Harlin, Seattle, Wash.

482,250.—SAW SET AND GAGE—C. F. Heath, Durham, Cal.

482,059.—CONSTRUCTION OF SEAWALLS—B. C. Kenway, Tacoma Wash.

481 956.—AUTOMATIC TROLLEY DISCONNECTOR, G. A. Kimball, Seattle, Wash.

482,183.—WATER PURIFIER FOR STEAM BOILERS, J. MacDonald, Los Angeles, Cal.

482,131 —ELEVATOR-CONTROLLING MACHANISM, A. J. McAdam, S. F.

482,047.—SHIPPING RECEIPT-BOOK—J. D. D. Mortimer, Stockton, Cal.

482,269.—CLOTHES-DRIER — G. W. North, Clarkes, Or.

482,272.—FRUIT-PITTING MACHINE — F. C. Philips, Healdsburg, Cal.

482,283.—FRUIT-DIPPER—E. E. Thomas, San Jose, Cal.

482,284 —FRUIT-PITTING AND SPREADING MACHINE—J. D. & E. E. Thomas, San Jose, Cal.

482,285.—GROCERS' CADDY—C. Toohey, S. F.

482,103.—PORTABLE BAND-SAWING MACHINE, A. C. Speer. Woodville, Or.

481,990.—POUND NET—Williams & Clevelaud, Astoria, Or.

482 288.—CAR COUPLING—S. R. Williams, Monmouth, Or.

The following brief list by telegraph, for Sept. 13, will appear more complete on receipt of mail advices:

California—Ira J. Briggs, San Francisco, lubricating cup; Q. V. P. Day, device for whippistres; Patrick J. Doling, Folsom, airsngth-testing device; John H. Drillsr, Los Angeles, automatic cut-off cask-filling faucet; Frank Forster, Etiwanda, movable sied; John G. Letteller, Los Angeles, machins for making box-hinding channsl strips; Joseph Mallard, San Geronimo, and J. H. Jones, San Francisco, devica for supporting and carrying vessels; John C. F. McGriff, Los Angeles, wirs alarm; M. P. Schetzsl, San Francisco, apparatus for the propulsion and transmission of water; Charles S. Webber, San Jose, stringing piance; Hagemann Brewing Company, San Francisco, trademark for beer.

Washington—John N. Brown, Roslyn, car-coupling; Lucia F. Cook, Tacoma, transportation system.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AIR-COMPRESSOR.—Michael Dillenburg. No. 481,850. Dated Aug. 30, 1892. This invention relates to air-compressing machinery and consists in such a construction of the piston and valves of the air-compressing pump or cylinder as to greatly increase their efficiency and to reduce danger of breakage of parts. The piston consists of an exterior sleave with an interior web, in which the piston rod is fitted to slide, and by a novel means the web and exterior sleeve are locked together, but are easily separated when desired. The valve is carried upon the end of the piston rod; a collar around the rod below the valve fits a chamber in the web and presses upon a spring contained in the chamber. This spring closes the valve against the seat in the outer sleeve and allows it to be drawn away when the piston is being retracted, so that air may flow freely through the valve for a new stroke.

LAUNDRY DRYING-ROOM.—John F. Chappell, S. F. No. 481,845. Dated Aug. 30, 1892. This drying-room for laundry purposes consists of a series of fireproof, nonconducting, vertical sections having drying-ropes extending longitudinally between them, suspending traveling rollers upon which they are easily moved to withdraw them from and introduce them into the drying-room, said endplates forming the ends of the drying-room when they are all closed, and the inner endplate closing the opening at the outer end when either one of the sections is drawn out for the purpose of removing or changing the clothes upon it. The ceiling is also of peculiar construction.

FRUIT-PITTING AND SPREADING MACHINE Judge D. Thomas and Edward F. Thomas, San Jose. No. 482,284. Dated Sept. 6, 1892. The object of this invention is to provide an apparatus which receives fruit, such as apricots, peaches and similar fruits having stones or pits, from the grader, places the fruit in position with the pit or stone standing with its longer diameter vertical, and delivers the fruit in this position to the knives, which split it and separate the pit from the meat, which is then spread and delivered upon trays in which it is to be dried, or it may be delivered without spreading when designed for canning or similar purposes.

FRUIT DIPPER.—Edward F. Thomas, San Jose. No. 482,283. Dated Sept. 6, 1892. In handling prunes, the fresh fruit, when it arrives from the field, is first graded and is then dipped in a strong caustic solution to cut the skins, then passed from this solution into a clear-water washing solution and thence to the trays upon which the fruit is dried. After drying, it is again returned to this house and is then passed through the steam and hot water for the purpose of cleaning and brightening it. This apparatus is designed to carry the fruit through these various dippings and to economize in the time and labor required for these repeated handlings. The apparatus consists of a peculiar wheel rotating within a casing having a dipping-trough at its lower portion.

SAW SET AND GAUGE.—Chas. F. Heath, Durham, Butte Co., assignor of one-half to W. W. Taylor. No. 482,250. Dated Sept. 6, 1892. This device is especially applicable to the setting of the teeth of crosscut saws and gauging the set thereof, this work being accomplished without recourse to a shop or large set of tools. It consists of a block of metal having one end formed to serve as an anvil, upon which the points of the teeth may be set, the anvil being held in one hand and the hammer by which the points are bent or set being held in the other. This block has formed upon another edge of it devices by which the gauging of the set is effected, and upon still another edge a means for effecting a set by what is known as a "spring-set." The device is a hand-tool, designed for the use of sawyers at work in the woods at a considerable distance from any point where tools can be obtained for keeping saws in order.

GROCERS' CANNY —Cornelius Toohey, S. F. No. 482,285. Dated Sept. 6, 1892. This is one of that class of receptacles serving as reservoirs from which to draw materials such as tea, coffee, etc., and known as caddies. The general object of the invention is to provide a caddy which, by reason of the independence of its base and top, will enable the grocer to use the base portion constantly and to fit thereto any number of successive tops. The special object is to provide for the utilization of the linings of tea-cases, which for this purpose will preferably be made of tin.

SEPARATING SAND AND SLIMES.—Georga Gates, Jackson, Amador Co. No. 482,241. Dated Sept. 6, 1892. This is an apparatus for separating the slimes and sand from coarser material arising from the crushing of ores. After the pulp has passed over the amalgamating plates of a battery, and such valuable precious metal as will adhere to the plates has been arrested, there still remains a considerable portion which is valuable, which passes off in the form of extremely light slimes, and which will pass off in suspension in the water. In order to separate this from the heavier and coarser sands which still remain, Mr. Gates has devised the apparatus which he has patented.

FRUIT-PITTING MACHINE.—Frank C. Philips, Healdsburg. No. 482,272. Dated Sept. 6, 1892. This machine for pitting fruits consists of a framework having a horizontal stationary shaft fixed at one end near the top and a sickle-shaped knife, the shank of which is fixed to the shaft so that the cutting-blade stands radially above the shaft and between two sprocket wheels which turn loosely upon the shaft. Other sprocket wheels are mounted upon a shaft at the opposite end of the frame, and chains passing around these wheels are caused to travel by a foot-treadle or other power and intermediate belting. These chains have carriers attached to them adapted to receive the fruit upon an elastic and slotted support, which carries each fruit against the edge of the knife where it is split and the pit is thus forced back through the opening in the elastic carrier while the latter passes on over the knife by reason of the slot in the carrier and deposits the fruit in a suitable receiver.

FOR "deadening floors" Gen. Loyre suggests the use of wood shavings, made incombustible by dipping them in a tub of whitewash or cement. Soft substances, including air-spaces, make an excellent nonconducting material to sound, and the saving in weight is important. A preliminary dipping in chloride of lime will disinfect the space between the boarding and the plastering. Mineral wool is much better, even if more expensive, and has the added value of positively excluding rats.

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ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED.	DELIN'T AND SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2,	Oct 6, Oct 27	C E Elliott, 3 9 Montgomery
Belle Isle M Co, Nevada	15	1c	Aug 22,	Sept 26, Oct 20	J W Pew, 310 Pine
Best & Belcher M Co, Nevada	52	25c	Aug 17,	Sept 22, Oct 13	L Osborn 309 Montgomery
Bullion M Co, Nevada	30	25c	Aug 11,	Sept 16, Oct 4	R R Grayson, 331 Pine
Challenge Cons M Co, Nevada	12	10c	Aug 29,	Oct 3, Oct 18	C E McCoy 331 Pine
Commonwealth Cons M Co, Nevada	9	10c	Sept 7,	Oct 15, Nov 9	R R Grayson, 331 Pine
Confidence M Co, Nevada	21	50c	Aug 13,	Sept 15, Oct 6	A S Groh, 414 California
Crocker M Co, Arizona	12	5c	Aug 11,	Sept 20, Oct 18	A Waterman, 309 Montgomery
Crossbow M Co, California	1	1c	Aug 4,	Sept 12, Oct 3	H D Walker, 309 Montgomery
Del Monte M Co, Nevada	6	10c	July 26,	Sept 5, Oct 5	J W Pew, 310 Pine
Evening Star M Co, California	5	1c	Aug 19,	Sept 21, Oct 5	J J Scoville 320 Sansome
Exchequer M Co, Nevada	33	1c	July 27,	Aug 31, Sept 20	C E Elliott, 309 Montgomery
Florida Hill M Co, Idaho	4	3c	July 29,	Sept 2, Sept 23	R R Grayson 331 Pine
Golden Fleece Gravel M Co, California	17	--	July 16,	Aug 24, Sept 30	W J Gleason, Phelan Block
Gover M Co, California	3	10c	July 28,	Sept 1, Sept 23	R McF Doyle, 15 Fremont
Guanacaru & California M Co, Honduras	7	$1.50	Aug 9,	Sept 15, Oct 8	Oliver, 22 Mint Avenue
Hale & Norcross M Co, Nevada	102	50c	Aug 11,	Sept 15, Oct 7	A B Thompson, 3 9 Montgomery
Independence M Co, Nevada	17	5c	Aug 15,	Sept 29, Oct 13	J W Pew, 3 0 Pine
Inyo Marble Co, California	18	50c	Sept 9,	Oct 22, Dec 1	A F Thane, 137 Montgomery
Justice M Co, Nevada	51	40c	July 26,	Aug 31, Sept 19	R Kelly, 419 California
Keystone Con M Co, California	3	$1	Aug 22,	Sept 26, Oct 18	J H Isham, 310 Pine
Mountain Tunnel M Co, California	5	7c	July 28,	Aug 27, Sept 26	E C Lander, 320 Sansome
Navajo M Co, Nevada	22	10c	Aug 17,	Sept 21, Oct 14	J W Pew, 310 Pine
North Belle Isle M Co, Nevada	20	40c	Sept 1,	Oct 6, Nov 7	J W Pew, 310 Pine
Northwestern G M Co, British Columbia	5	20c	Aug 17,	Sept 25, Oct 15	F Bonacina, 438 California
Peer M Co, Arizona	13	10c	July 13,	Sept 8, Oct 6	A Waterman, 3 9 Montgomery
Quartette M Co, Arizona	18	5c	July 6,	Sept 1, Sept 20	A Waterman, 309 Montgomery
Silver Hill M Co, Nevada	31	5c	Aug 3,	Sept 6, Sept 27	D O Bates, 309 Montgomery
Silver King M Co, Arizona	9	25c	Aug 26,	Oct 7, Nov 4	J W Pew, 3 0 Pine
Teresa M Co, Mexico	8	10c	Aug 19,	Sept 22, Oct 8	K J Willats, 309 Market
Western Star M Co, California	1	2c	July 25,	Aug 30, Sept 21	J A Reed, 328 Montgomery
Yellow Jacket M Co, Nevada	52	25c	Sept 5,	Oct 7, Nov 11	W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Eureka Mining & Smelting Co, Nevada	Annual	A F Main, 515 Sansome	Sept 29
Grand Prize M Co, Nevada	Annual	R R Grayson, 331 Pine	Sept 20
Gray Eagle M Co	Annual	A W Barrows, 303 Cal	Sept 21
Pacific Coast Borax Co, California	Annual	A H Clough, 101 Sansome	Sept 19

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Cahn, 308 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Con Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Sept 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug 24.		WEEK ENDING Aug. 31.		WEEK ENDING Sept. 7.		WEEK ENDING Sept. 14.	
Alpha	.15	.15	.15	....	.15	....	.15	....
Alta	.25	.20	.20	.30	.25	....	.20	.25
Andes	.30	.25	.30	.40	.35	.40	.35	.40
Belcher	.45	.35	.90	1.45	1.00	1.20	1.15	1.80
Belle Isle	.05	....	.10	....	....	....	....	....
Best & Belcher	1.30	1.05	1.10	1.60	1.20	1.40	1.25	1.40
Bullion	.25	.10	.15	.25	.20	.25	.10	*.50
Bodie Con	.25	....	.30	....	.30	.50	.35	.40
Bulwer	.30	....	.25	....	....	....	.30	.35
Commonwealth	.10	....	.05	....	....	....	.05	....
Con. Va. & Cal	3.33	3.00	3.15	3.40	3.20	3.35	3.15	3.35
Challenge	.25	.20	.20	.35	.25	.30	.35	.40
Chollar	.50	.40	.40	.60	.50	.60	.55	.65
Confidence	....	....	.90	1.35	1.10	1.20	1.05	*1.50
Con. Imperial	....	....	.05	....	.05	....	....	....
Caledonia	.15	....	.15	.25	.20	....	.20	....
Crown Point	.55	.40	.45	.80	.50	.55	.55	.70
Crocker	....	....	.05	....	....	....	.05	....
Del Monte	.05	....	....	....	.05	....	....	....
Eureka Con	2.00	....	....	....	....	....	....	....
Exchequer	.05	....	.05	*.15	.05	....	.20	....
Grand Prize	....	....	....	....	....	....	.05	....
Gould & Curry	.85	.55	.55	.95	.80	1.05	.90	1.00
Hale & Norcross	.75	.45	.55	1.25	.85	1.00	.90	*1.40
Julia	.05	....	....	....	.05	....	....	....
Justice	.05	....	.05	.20	.15	....	.15	....
Kentuck	....	....	.15	....	.10	.15	....	....
Lady Wash	....	....	....	....	....	....	....	....
Mono	....	....	.15	....	.10	.15	.15	....
Mexican	1.20	1.15	1.05	1.40	1.20	1.35	1.30	1.45
Navajo	....	....	....	....	....	....	.05	....
North Belle Isle	.05	....	.05	....	....	....	....	....
Nev. Queen	....	....	.05	....	....	....	.10	....
Occidental	.40	....	.30	.40	.30	....	.30	....
Ophir	2.15	2.00	2.05	2.45	2.20	2.35	2.30	2.45
Overman	.30	.25	.30	.45	.35	.40	.35	.45
Potosi	.45	.35	.40	.55	.55	.50	.50	.70
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	.10	....	....	....	....	....
Savage	.70	.55	.50	.90	.70	.85	.75	.90
S. H. & M	.15	....	.20	.30	.25	....	.25	.30
Sierra Nevada	1.05	.90	.90	1.50	1.35	1.65	1.50	2.10
Silver Hill	....	....	.05	....	.05	....	....	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.05	.75	.85	1.30	1.20	1.35	1.25	1.45
Utah	.20	.15	.25	.30	.25	....	.30	.35
Yellow Jacket	.50	.40	.45	.75	.50	.65	.50	.70

*Assessment added.

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of limo, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Krochnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tellings, and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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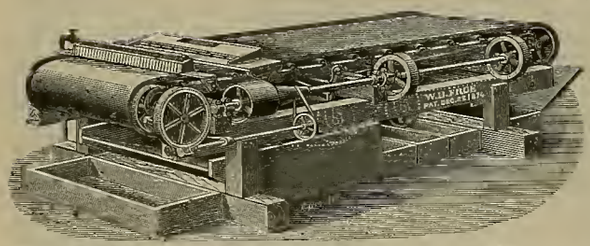

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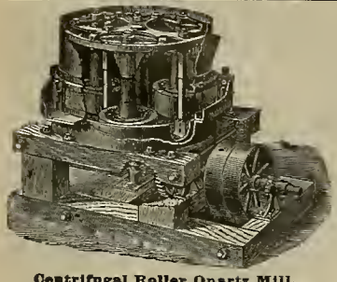

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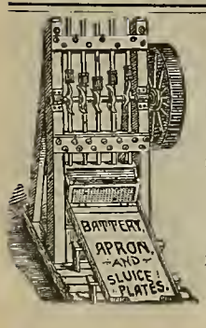

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL. LXV.—Number 13. DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, SEPTEMBER 24, 1892.

Three Dollars per Annum. Single Copies, 10 Cents.

A New Quartz Crusher and Pulverizer.

A. P. Anderson of Oriental, Esmerelda Co., Nevade, is a prectical man in the quertz crushing business and has not invented a crusher because he could meke a device in thet line, but beceuse he thought he could get up as good a one as eny now in use in the country. The mechine which he has just petented through the MINING AND SCIENTIFIC PRESS Patent Agency, is a wet and dry crusher end pulverizer, heving immense screen surfaces, and intended to be run with great speed, or, as he says, "from 20 to 40 miles per hour." There are very few pieces to it end ell of them ere strong. The crusher rollers are intended to be about one-third the diameter of the crushing compertment, to leeve plenty of room for the free circulation of the material to be crushed. The cuts on this pege show the new machine. Fig. 1 is en elevetion, the pulp-bonnet being partly removed; and Fig. 2 is a vertical cross-section.

A A are two rollers journeled upon the supporting frame B, of eny suitable construction, so es to stand parallel with eech other and neer together. Upon these rollers end supported hetween them is a short cylinder C, the length of which is approximetely the seme as its diemeter. Upon eech end of the exterior of this cylinder are flanges D, which serve as guides treveling against the ends of the rollers A to keep the cylinder in place upon the rollers. A belt E passes around this cylinder and any suitable driving pully or device, from which power is applied to rotete the cylinder.

The roller A, which is nearest the source of power, has its central portion *a* cut away sufficiently to allow the lower portion of the belt to pass out freely between tbe two sides of the roller, and the rear roller hes a chennel or depression *a'* cut in its face corresponding with the channel in the front roller, so as to allow the belt to pess freely between the roller and the drum. By this meens the drum is caused to rotete as repidly as may be desired by the movement of the belt which passes about it, and the supporting rollers turn freely, so as to allow it to to rotate easily. The drum is made of iron or other suitable materiel, end has in the center, projecting inwardly, a ring or flange G, which serves to divide its interior into two parts. Within this drum are fixed the dies H, which are made in the form of rings, the central portion of which is thicker than the ends. The inner ends of the rings ebut against the central ring and the outer ends against a ring I, which extends entirely around the inside of the drum at eech end, seid rings being seperete from the cylinder C and fitted into its ends against the ends of the dies H in any appropriate menner. The thicker portion of these dies form the surface upon which the crusher-rollers F travel.

This crusher consists of two separate rollers, one of which is adepted to travel in each of the compartments formed by the centrel ring G of the cylinder. These rollers have squere tepering holes through their centers, end are connected together by a square shaft *f* (which is also slightly tapering), which is screwed fast in place by a nut *f'*, fitting onto the screw-threaded smaller end of the shaft and seeted in the depression made for it in that end of the roller. Around each of these rollere is fitted a shoe Q, which consists of a cylindrical drum open at one end and having a head at the other. These drums fit over the cylindrical rollers, being put on from the inside, so that the closed ends or heads are adjacent to each other.

At each end of the cylinder is fitted a screen K. The peripheries of these screens abut egeinst the flanges D upon the outer ends of the drum, and are clemped in plece by rings L, which fit outside of tbe screens and hold them ageinst these flauges, being secured by suitable bolts I'. M is a ber bolted or otherwise secured to the rings L, and extending ecross the end of the cylinder having en enlargement at the center with a hole through it. Through this hole is fitted a feed-funnel N, the inner end of which

Fig. 2.

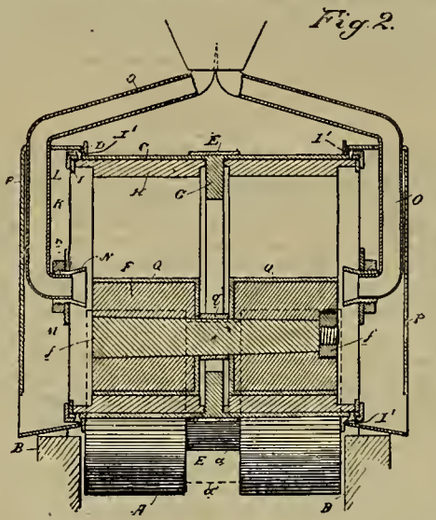
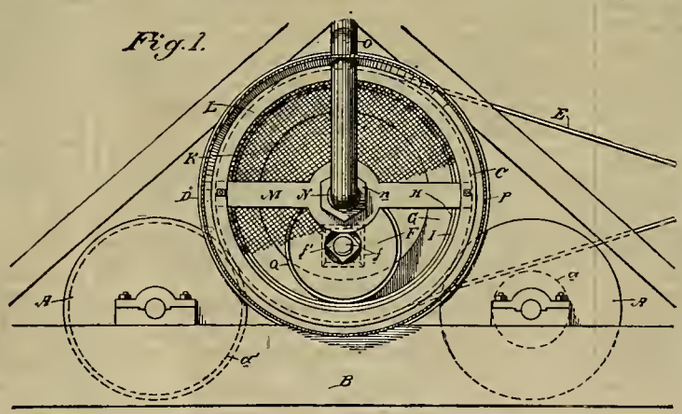


Fig. 1.



ANDERSON'S WET AND DRY QUARTZ CRUSHER AND PULVERIZER.

is of lerger diemeter than the outer, and it is held in plece by a nut *n*, which screws onto the outer end. A ring I extends around the inside of each end of the cylinder hetween the periphery of the screen and the inner ends of the dies within the cylinder, as previously stated.

A feed-pipe O extends from the supply-hopper down to a point above the cylinder, where it divides, and one branch passing around eech end of the cylinder delivers the meterial through the central feed-funnel N. When the apparatus is set in motion, the drum or cylinder is rotated with greet rapidity, and the two-part roller is caused to travel around its interior, while the meterial to be crushed is fed in through the feed-hopper and chutes. As fast as the material is pulverized it passes tbrough the screens and is discharged over amalgamating plates or in any desired manner. Over each end of the cylinder are fitted what the inventor terms "pulp-bonnets" P, which are slightly funnel-shaped, and serve to prevent the pulp from being splashed out to a great distance from the cylinder hy its rapid rotetion. These pulp-bonnets fit closely to the ends of the cylinders, but the cylinder or drum revolves freely while the bonnets prevent the escape of the meteriel. The feed-pipes pass tnrough the pulp-bonnets at the top.

Utilizing Waste Products of Petroleum Distillation.

In the distillation of petroleum or hydrocerbon oils for the purpose of manufacturing illuminating gas there remains a residue after the lighter portions are distilled awey. This residue consists of water and heavy oil, which differs considerahly from the tar which forms the residue of coal distillation. The characteristic of this petroleum residue is a tough, elastic, oily consistency, which ceuses it to envelop and cover smell particles or globules of the water with which it is mixed with such persistency that it is impossible to separate the two by any ordinary known process. At the works of the Pacific Ges Improvement Company at North Beach, in this city, this residue has been allowed to run to waste, since it was not considered of eny velue for fuel or other purposes. J. P. Engle, of the firm of Engle & Son, deelers in lumber and moldings, whose shop is neer the gas works, now uses this meteriel for fuel under the boiler in his shop, having devised and patented a meens to effect a seperation of the waste products and a way to recover them.

He employs an apparatus in which two surfeces are constantly rubbed together while the mixture is fed between them, so that the mechanicel rubbing acts to separate the heavy oil from the water and allow the letter to flow off separately from it. When this seperation has once been made, the oil will remain seperete from the water, and, being slightly heavier, will gradually sink to the bottom, so that the weter may be drawn off from the top neerly or quite clear of the watery mixture. The oil thus seperated mey be used directly as a fuel or mixed with any dry refuse meterial which will ebsorb it end form a permanent fuel for future use, or it may be employed for any other purpose for which it is fit. This weste product is unlike coel-tar, from the fact that it is so nearly the same specific gravity es weter thet it will not separate by gravitation. Furthermore, the constituents of this petroleum-oil are tough and elestic, covering the globules of water so that the necessery heat required to convert the water into steam only serves to creete a foam which on cooling again leaves the originel constituents the same as before boiling. In order to make a complete separation of the water from the oil, Mr. Engle employs any weste-absorbent meterial, such as sawdust, shevings, cotton and woolen waste, rice-husks, etc. A very simple apperetus is employed to complete the separetion after the substances have passed through the mechenicel rubbing apparatus. The peculiar property of the petroleum compound is such that the heavier portion is more reedily absorbed by the dry meterial than the water. The consequence is thet the oil and spirit will he absorbed first, and the water will remain unebsorhed and flow out immediately through a waste pipe, end the mixture thus formed is immediately ready for the grate. Mr. Engel seys thet it will then he found to produce a fuel equal in heet and endurance with the usual run of steam coal. This mixture he is now using under his boiler for fuel purposes with remarkahle success.

THE Live Oak Drift Gravel Mine Company has brought suit against its former secretary, Joseph Morizio, to compel him to restore $3293.02 collected by him.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Draughtsmen Wanted—Frazer & Chalmers, Chicago, Ill.
Diamond Drill for Sale—Jas. De Fremery & Co.
Type-writers—G. G. Wickson & Co.
Refrigerating Machinery—Vulcan Iron Works.

Comment.

The closing down of the Temescal tin mine at Cajalco hill, San Bernardino county, which occurred last week, has not been unexpected. The mine has not borne out the promises of its owners. People familiar with the mine and not interested in its sale, were certain that the English investors would never get their money back. The mine was sold for a high price and a great deal of money has since been expended upon it. The tin ore was found in pockets and was by no means as abundant as the buyers had been led to believe. During the past thirteen months the mine has only yielded 150 tons of ingot tin worth about $70,000. The investment was $2,000,000, and the monthly pay roll about $15,000. Some delay in the payment of wages caused the men to strike last week and all work has been stopped. It is not all likely that this is the final closing of the mine, since with so large an investment the owners will be certain to give the hill a very thorough prospecting. It is of course possible they may come upon a deposit of ore which will pay to work better than the ore thus far found. It is unfortunate that this property has been taken as a subject of political agitation, owing to tariff questions regarding tin and tin plate. There is no duty on pig tin at present, so the product of the mine had no real bearing on the question. But one party having seen fit to make a great fuss over American tin, the other took occasion to try and prove that this mine amounted to nothing. As this was the only tin-producing mine in the United States, those in the Black Hills of Dakota turning out nothing as yet, the failure is likely to be heralded abroad to the detriment of the real mining interest of the State. It is greatly to be regretted that thus far the mine has failed to come up to the buyer's expectations. When the election is past the politicians will let the mine alone. Then, doubtless, the company will regain courage and renew operations in search of paying deposits of ore.

The Executive Committee of the California Miners' Association were wise in postponing the date of the annual convention until after the date of the Presidential election. The association is nonpolitical in character, and it is not desired that politics shall be brought into it. There was some danger of this, however, and by postponement this will have passed away. The hydraulic miners are satisfied that during the next session of Congress some sort of bill for their relief will be passed. Probably it will be the amended Caminetti bill, which will permit them to run their mines provided they can restrain the debris. Under present circumstances, they can be enjoined even if they build dams and keep the debris back. The opposition of the valley counties to the building of dams will scarcely amount to much, since their position now is a dog-in-the-manger one, with which few sympathize.

The new lighthouse tender, Columbine, has started from Cleveland, Ohio, to Portland, Oregon, by way of the great lakes, the St. Lawrence river and Cape Horn. It will cost $6000 to get her to Portland, but the Treasury Department does not mind a little expense like that. There is talk, too, of the new steel tug built for the Mare Island Navy Yard in this State, and now in use at the Boston yard, being sent around here and taking the place of the condemned tug Ivy. As it will cost something like $6000 or more to steam here by way of Magellan Strait there is some serious thought as to whether it would not be better to expend that amount of money toward building a tugboat at the Mare Island yard. For the size of boat required the facilities are said to be ample, with few exceptions. The hulls, boilers and engines could be built here as cheaply as elsewhere. In fact both these vessels should have been built on this coast. The lighthouse tender could have been built at Portland where she is to be used: and the tug could have been constructed at Mare Island Navy Yard or in the shipyards of this city. If our Senators and Representatives in Congress would look after such matters a little, the Government officials would stop giving such jobs to their favorite builders, and be compelled to distribute such work over the country. We can build vessels as well and as cheaply here as they can in the East, and when they are to be used on this coast, should be built here. It is a useless expenditure of public money to pay for such long voyages, simply that some one near to the officials may have the contracts for hulls, boilers and engines.

Comstock Mining.

The returns from the Consolidated California & Virginia mine for the month of August, to which we alluded last week, indicate that ore worth $23.91 per ton at the mine cannot be worked except at a loss to the owners of the shares. The 4350 tons of ore extracted from that mine during the month mentioned was worth, according to car-sample assays, $23.91 per ton, or a total of $112,708.50. This ore netted the company, after deducting milling and transportation charges, $35,489.50, or about $8.15 per ton. It seems strange that while $3 free-milling gold rock can be made to pay elsewhere, $23.91 rock, going more than half gold, cannot be made to pay on the Comstock. Of course there is an explanation for this, and it may be divided under several heads:

First. The fact that the mills make such low returns. Formerly mills bought Comstock ores outright, paying the companies 65 per cent of the wagon or car-sample assay, and got their pay out of the 35 per cent they retained. In the Consolidated California & Virginia working for August, the mill company returned 61 63 100 per cent of the car-sample assay and charged $5 per ton for crushing, so the company is out $21,750, and the mill company got the 35 per cent residue besides.

Second. The cost of transportation is also an outrageous item, $1 per ton being charged for transporting the ore about 20 miles. When it is realized that the mines of the Comstock and the citizens of Nevada built the Virginia & Truckee Railroad and presented it to the gentlemen of porcine inclinations who now own it, the extent of the extortion can be appreciated.

The owners of this road can have very little real interest in the State or the mines when, in this time of depression and assessments on the Comstock, they refuse to reduce their bonanza-time scale of charge.

Third. Another outrageous charge is that made for water. The company which supplies the water for the mines and mills on the Comstock is owned by the same set of men who have made a success out of milling the ore from mines, while the mines themselves have had to be kept running by assessments on stockholders. The rules of this water company are peculiar and, one might say, slightly arbitrary. If a mine or a mill shuts down, the employees of the water company go right along charging up the water, and when the company concludes to start again the water company informs them that they cannot use the water until the back charges are paid up. If the mining company demurs, they are informed that if they do not like it they can get their water elsewhere. As there is no other water to be had the decision can be guessed.

Fourth. Then there is the nice little charge for wood. At Empire City it costs $5.50 a cord. Empire City is 20 miles away from Virginia City and Gold Hill, and when this $5.50 wood gets to those places the price is $9.00 per cord.

This advance of $3.50 per cord is due to the charges of this same Virginia & Truckee railroad. The timbers for the mines are all supplied on the same scale of overcharge. As these timbers are also furnished by this same ring, they do not economize on the charges, but take "all the traffic will bear," and the poor devils that own the stock can continue to pay assessments. The history of the balance of the material furnished the mines is the same one of plunder, overcharge and mismanagement. Superintendents who are paid fancy salaries spend a good part of their time in San Francisco, or in junketing trips around the country, relying on the influence of their mill-ring relations to keep them in place. It is a "go as you please" race as long as fools can be found to pay assessments. Under such circumstances, the man who buys Comstock shares is apt to commit financial suicide. If an ore body is found, the mill owners get the best part of it or eat it up in charges and poor work, and the shareholder is assessed to take it out. If they do not find an ore body, they assess him to do the prospecting work. Probably the best way to remedy these various evils is for people to refrain from buying the shares in Comstock mines while under the present system of management. If they keep their money in their own pockets, they at least know where it is. The mines could be made to pay very well if conducted by proper methods, but the existing conditions are very discouraging to all persons interested in the advancement of legitimate mining.

Foundry Notes.

At the Globe brass and bell foundry of Whyte & De Rome on Main street in this city, the castings for the bronze statutary for the New City Hall grounds are being made. They have been at work on the contract for six months past, and many of the figures are ready for cleaning and mounting. The central group, representing California, has been well cast, the figures being in parts. That of California stands twelve feet high. Besides the central group there will be two lesser groups, each eight feet in height, representing different stages of California's history, and two single figures representing industry and commerce. There will be also four panels. The firm has over two years to complete the contract. To undertake this work the firm had to put in a 10-ton crane and build a new core-oven, the largest in the city. These groups of statuary were provided for in the trust deed of the late James Lick, and will be placed on the plot facing Market street, in front of the City Hall.

At the Union Iron Works the principal activity is in the ship-building department, and a large force of men is employed on the battleship Oregon and cruiser No. 6. On the Monterey the turrets are being prepared to receive the large guns which recently arrived from the East. It is probable that either the battleship or armored cruiser authorized by the last Congress will be built here. The plans will be ready for inspection by the bidders by November 1st. The bids will probably be opened and the contracts let by January 1st. Including the 8000 tons of armor required for these two ships and for the completion of the other armored vessels building, these contracts will aggregate nearly $12,000,000, the largest ever given out by the department at one time. The armor contract will amount to about $4.500,000, and the construction of the two ships to about $7,500,000—$4,000,000 for the battleship and $3,500,000 for the armored cruiser. The Union Iron Works will bid on these vessels, and have hopes of at least getting the battleship. This vessel will be of 11,250 tons, which is larger than the three now building and will be given 11,000-horsepower engines.

Death of John T. Evans.

The numerous friends and acquaintances of John T. Evans, the well-known analytical chemist and assayer, will be pained to hear of his death which occurred at his residence in Alameda last week, after a short but distressing illness. With the mining community, also, the death of this gentleman will be deeply deplored, he having been in his professional capacity well and favorably known throughout the mining districts of California.

John T. Evans, who was a native of Wales, came to this country when very young, stopping first in Wisconsin where he obtained a liberal education and spent his early manhood, having had charge of the Rippon College before he left for California. About the year 1872 he came to this State and entering the metallurgical and chemical department of the City College, then under the supervision of Prof. Thomas Price, there remained a pupil for several years. So well did Evans perfect himself in these branches that Prof. Price, a few years later, employed him as his chief assayer and chemist, which place he held until two years since, when he engaged in this line of business on his own account, connecting therewith a school for teaching assaying.

Mr. Evans was a very skillful man in his profession and enjoyed the confidence of all who had any business with him. He was conscientious and thorough in everything he undertook and was always a close student in those departments of science in which he was interested.

During his life Mr. Evans occupied many positions of responsibility and honor, having been at one time vice-president of the Academy of Sciences in this city, and of which he was still a member at the time of his death. He was also secretary of the Cambrian Mutual Aid Society. He belonged to the Ancient Order of Foresters, to the American Chemical Association, and to various other scientific or benevolent societies.

Coast Industrial Notes.

THE new electric street railway in San Diego was formally opened on Tuesday of this week.

THE fishermen of Seattle have formed a union with nearly three hundred members, which proposes to regulate the price of fish.

SUPERINTENDENT J. J. Moynahan of the Gem mine, Coeur D'Alene, Idaho, is in this city looking for miners to send up to the mine.

SEVERAL cigarmakers have been set to work by the San Felipe Havana Tobacco Company of Gilroy, making up the Culp plantation tobacco.

THE manufacture of orange oil, which sells for $7 a pound, is coming to be a leading industry of Riverside. It is made from the peel of the fruit.

THE trail cars of the Oakland Consolidated Electric road are being changed into motor cars. The new observation cars recently received are now ready for service.

WORK on the Bakersfield and San Miguel railroad is being steadily pushed, and the moving end is now completed to a point about forty-three miles distant from the Sumner depot.

THE Oakland Consolidated Street Railway Company has filed an application with the City Council for an electric street railway franchise along Center street, from Sixteenth to First, on Eighth from Grove to Franklin, and along West street, from Eighth to Market street.

THE Sacramento City Trustees have ordered a special election for October 13 h, to vote on $100,000 city bonds for levy improvements, the idea being to so strengthen and raise the city's levees as to make them absolutely impregnable and make further expenditures unnecessary for many years.

THE paper mill at Lowell, Wash., has turned out the largest rolls of paper ever manufactured in the world. Each roll weighs 3600 pounds, and if unrolled the paper in each would make a strip thirty-five miles long. They were taken to Tacoma to be placed on exhibition, and will be sent to the World's Fair.

A PRIVATE telegram from San Francisco received in Grass Valley, announces that the arrangements for the organization of the company to introduce electric power from the South Yuba river to Nevada and Grass Valley mining districts have been perfected and the money for the enterprise secured. The work of construction will be commenced this season.

THERE is a rumor to the effect that the United Verde Company will put up a plant at Jerome, Arizona, for refining. Should such action be decided on, it means the expenditure of $200,000 in the near future at that camp. The contractors for the bucket line over the mountains to this property, have been compelled to change the line, but are confident of ultimate success.

MR. COLQUOHON, of Golden B. C., has obtained the necessary ore-crushing appliances and is now treating ore by the cyanide process. From experiments which have already been made, it appears that the cyanide process is well adapted to the refractory ores of the Province and as there are so many of this character there should be a great future before the patentees.

OVERLAND shipments of produce and merchandise from Northern and Central California via Southern Pacific lines in August were 45,860 tons, against 30,428 tons in August, 1891. This is a tremendous increase for this year. The shipments were as follows: From San Francisco, 18,916 tons; Oakland, 1268 tons; San Jose, 3730 tons; Stockton, 3559 tons; Sacramento and East, 16,374 tons; Marysville, 1536 tons; Portland, 477 tons.

THE Holmes mine at Candelaria (Nev.) has not been started yet, although everything is in readiness to do so when orders are received from London. The Mt. Diablo mill is running to its full capacity, and the ore is keeping up to a grade which insures a small profit. The times are not propitious for any excitement in a silver camp, and those that can run along through the prevailing dullness in the bullion market are doing very well.

RECENT purchases of thirty acres of land at Fitchburg, east of Fruitvale, Alameda county, are said to be for the Southern Pacific, and that the company will extend its local train service to that place and construct a loop 1200 feet in diameter, round which the trains will run in order to avoid changing the engines from one end to the other at the terminus. The construction of the new electric line has probably caused the Southern Pacific to extend its local service.

J. W. HARTZELL has filed with the Council of Santa Rosa an application for a franchise to put in a new system of water works. He is at present building the water works at Ukiah. His plan is to bring water from the Russian river, fourteen miles. Wells are to be sunk on the banks of the river, and the water piped to a reservoir on an elevation near town sufficient to give a pressure of ninety pounds. It is claimed that it will cost $50,000 to bring the water from the river to the reservoir.

SAN DIEGO wants its own waterworks, and the committee of the Council recommend that a special election be called at once, submitting to the voters of the city the issue of bonds in the sum of $665,000, for the purpose of constructing and acquiring a water distributing system for the city. The report is accompanied by the estimate on the cost of a new system of pipes, all of cast iron, as formulated by the water commissioners, and by the proposition to furnish water as given by the Flume company.

THE Butte (Mont.) electric light plant has been sold to the Silver Bow Electric Light Co., for $225,000. The purchasers are St. Paul and Boston capitalists and are members of the Thomson-Houston company. The deal speaks eloquently for the confidence reposed in Butte investments by eastern capitalists. The T. H. people acquire a first-class plant and a very lucrative business and the Butte owners of the old company realize a good profit on their investment, so the transaciton is advantageous to all concerned. There are only three stockholders in the Butte plant, W. A. Clark, P. A. Largey and H. A. D'Acheul

ON Monday September 10, the first stake was driven, and first work done in the construction of the San Luis and San Joaquin, or "East and West" railroad. Chief engineer M. M O'Shangnessy and Treasurer L. C. Branch of the S. L & S J. R. R. Co., arrived at San Luis Obispo by steamer from San Francisco, and with a corps of surveyors immediately went to the field of operations. This record is made as the commencement of operations the most important for the future prosperity of San Luis Obispo county ever undertaken within its limits. It is expected that this work will be pushed to completion without delay throughout its entire contemplated system.

JAMES PORTEOUS of the Fresno Agricultural Works has just completed and shipped from Fresno to Spain, by way of New York, two of the latest improved raisin stemmers of the largest size, with a capacity of from five to seven tons each per day. The same shop has made stemmers for the Australian market, and has successfully competed in that field. It had scarcely been expected that this young city, only a few years old, and scarcely past the experimental state so far as the raisin industry is concerned, would be able to teach the Spaniards how to stem raisins and furnish them the machinery to do it with, when Spain has been in the raisin business from time immemorial. But all these things have come to pass.

GEORGE M. HARRIS received a franchise recently to construct an electric railway and erect a light and power plant in Phœnix, A. T. He has enlisted $300,000 of Denver capital for the enterprise. Granville Malcom, Judge Lindell, James Russell of Denver and James R. Fleming are the principal stockholders. The franchise compels the company to furnish fifty sixteen-candle incandescent lights to the city free, and all additional lights for the city 20 per cent off. Considerable business already awaits electric power, as the water pressure is insufficient. As a corollary to the enterprise, the company proposes a hotel costing $300,000, to be erected at the north end of the electric line, outside the city limits, as a winter home and sanitarium.

MESSRS. Stebbins & Porter, miners and millmen from Calico, have been making thorough tests of the MacArthur cyanide process at Reese's mill, below Havilah, Kern county, with astonishingly good results. It is reported that only a trace of gold can be found in any of the tailings after this treatment. At any rate, the parties are so well satisfied that a tank of fifteen tons capacity is now being constructed at that mill, and complete arrangements will be made for treatment of ores on a large scale. It is stated that Mr. Stebbins enthusiastically declares that any ore in the Havilah can be made to yield all but a trace of its gold by this treatment. If this be true, Havilah will become a flourishing mining camp again. The gold in these ores is very pure indeed, and heretofore there has been great difficulty in saving it.

PETROLEUM has been known to exist in the foothills and ravines back of Oakland for a great many years. There are indications of it on the waters of nearly all the springs and running streams near the city, but for some reason or other no boring has ever been done until recently. Now, the Ainsworths and their associates, of Redondo Beach fame, have begun prospecting in earnest. A number of wells are being sunk near De Laveagas Station, on the California and Nevada railway, about a mile beyond Wagner's ranch, and the indications are said to be very favorable for a discovery of oil. The strata being bored through are similar to the formation at Stockton where the gas wells are located, and similar to the ground bored through at Pleasanton about a year ago, where gas flowed for several weeks.

SURVEYORS have been, for some weeks, in the field planning the best route for the San Francisco and Santa Clara Valley railroad. Already, two preliminary surveys have been run. The starting point of both is the same, a location on the bay, opposite Mayfield. From there one survey runs through the town of Mayfield back to the base of the foothills, and thence along the warm belt to Saratoga, Los Gatos, and down through Coyote Pass to Gilroy. The other survey runs about a mile south of Mayfield to the foothills, and thence as in the first survey. Already, the company is said to have, in San Francisco, twenty-five miles of steel rails. As soon as the surveys are completed they will be considered, and that found to be the most advantageous will be adopted. The actual work of construction will then immediately be commenced.

PROTESTS continue to multiply against the application of the San Francisco and San Mateo Railroad Company, through Behrend Joost, for a franchise for electric railroad privileges on many streets of the city. Residents in the neighborhood of Holly Park are strongly objecting to the granting of a franchise for tracks on the two blocks of Mission street between Thirtieth and French streets, and also on Arlington and Charter streets. It is claimed that the application is not made in good faith, but simply to hold the streets indefinitely in order to prevent competition. Property-owners on Clarendon heights particularly object to the granting of a right of way between Ashbury and Eighteenth streets and the park. It is said that Joost has already secured from the last Board of Supervisors a franchise which enables him to reach the park.

THE owners of the British bark Martha Fisher, last year, being unable to get a return cargo at Victoria, B. C., decided to take a load of Alaska guano to England, thinking it would be sold as easily as the guano obtained from the southern islands. The bark was loaded and arrived in England, but the guano did not meet with the favor expected; in fact, the experiment was far from a success. Captain Meadowcraft, who was present when the hatches were lifted, says that the smell would cure the influenza with one sniff. After the cargo had been discharged, no one cared to handle it, and when the Martha Fisher left Liverpool last February it was still in a heap, and was for sale at the purchaser's price. Even if the guano had been sold, there would not have been much profit left for the owners, as after the bark was discharged it took the crew a couple of months to clean her.

THE site for the dam of the electric power company which is to furnish power to the mines and mills of Grass Valley and Nevada City, is to be on the south Yuba river, about two miles above the Purdon bridge. The location will be at a point where the river narrows, and will be upon a rock foundation, making a secure footing for a dam, which cannot be carried way by any flood that may come into the river. It is the intention to have the dam constructed before the winter rains set in. When the dam is secured the canal will be commenced. This will be four miles in length. From the end of the canal the water will be dropped 380 feet to the bank of the river where the dynamo plant will be set up, and from which the electric power will be transmitted It is the expectation that the work will be completed and the electric power be ready for the use of the mines at an early date next Spring.

THE Santa Cruz Engine and Boiler Works have built a traction engine which has just had a trial trip. This engine is the invention of Mr. Orin Wait, Superintendent of the S. C. E. & B. Works, and was put up in these works under his directions and after patterns furnished by him. It is not only a traction engine, that is, a machine for hauling upon the common roads, but it is equipped for pile driving, sawing wood, crushing rock and every purpose of a stationary, portable or donkey engine. Its hauling capacity with its single engine is from twelve to fifteen tons, at say, a three mile per hour speed, which, of course, can be much increased by making it a double-engine machine. The power is applied by the link belt which far excels the gear wheel. The speed of the machine when empty can be run up to five or six miles an hour. Its weight is five and a half tons, it having been purposely made small for a test and experimental machine—its size and power can be increased indefinitely. The wheels are six feet in diameter with a 14 inch face furnished with cleats. Its steering apparatus is of a new pattern and is handled very easily and the machine can be turned around in a space not greater than that required for a two-horse wagon.

Personals.

GEORGE D. ROBERTS has gone to Denver to buy machinery for a mine in New Mexico.

JAMES H. TIBBITS is superintendent of the Belmont mine, Sutter Creek, Amador county.

C. W. AYERS has been given charge of the department of mining exhibits at the Portland exposition.

T. G. DIVINING has been reelected superintendent of the Gray Eagle mine, Forest Hill divide, Placer county.

PHELPS, DODGE & Co. are succeeding with their new leaching process, at the Copper basin mines, Arizona.

F. H. HUFF has brought to Salt Lake what he thinks is tin-bearing ore from a find recently made near North Ogden.

J. T. BREEDEN has relocated a promising ledge near Mount Sterling, Jackson county, Oregon, about twenty miles above the Little Anaconda.

THOMAS EVANS, former superintendent of the El Dorado Water and Deep Gravel Mining Company, who has been on a visit to Wales, has returned to Placerville.

GEORGE MCINTYRE, discoverer of the district which bears his name, near Boise City, Idaho, has sold an interest in several claims to George Clark. The mines are on Picket Pin creek.

E. HUHA, Carl Whily, W. Bentz and B. Brommell of San Francisco, stockholders in the Odin mine, have been up at Nevada City looking at the property. They are getting into good gravel.

A. J. SHOTWELL and E. M. Albertson, of Boulder Colorado, are inspecting the mines in and around Mineral Park, Arizona. They will remain in Mohave county the greater part of this fall and winter.

MESSRS. N. BRALNOBER and S. Wartenweiler of Montana, are interested in a mining deal involving the great La-Bellevue or Cabell mining property in Granite district, Oregon, and have recently been visiting the mine.

ROBERT J. DEVLIN has a contract for $200 per month with Sacramento county to prosecute hydraulic miners. The contract will expire in a few months, but it is probable he will be employed in the same work by the new Anti-Debris Association.

THE San Francisco Microscopical Society gave a reception to Prof. Joseph Le Conte of the University of California on Wednesday evening. Prof. Le Conte has been abroad for the past year and has just returned to his duties at the University.

LUTHER WAGONER, the mining engineer of this city, is now in charge of the Washington Reduction Company at Conconully, Okanogan county, Washington. The new reduction plant has just been started up. Mr. Wagoner is in charge of a force of sixty men in mines and mill.

C. H. AKERS, who came to Prescott, A. T., from the Hillside mine the other day, says that Superintendent Rickard has been experimenting with the treatment of the ore by the cyanide process, and has succeeded in obtaining a very large percentage of the metal at a cost of $3.00 per ton. A large plant will soon be placed at the mine to treat the ore, the machinery for which is already en route.

ZINC shavings found in the cyanide process cost fifty cents per pound if ordered from the agents of the MacArthur, Forrest Co., but can be made at the works of any one at the expense of fifteen cents per pound.

THE California Association of Civil Engineers has elected the following named as its officers for the ensuing term: Hubert Vischer, president; C. E. Grunsky, vice-president; Directors—George F. Allardt, William Ham Hall, James D. Schuyler, S. Harrison Smith, E. E. Tucker.

Safety Lamps for Mines.

A Comparison of the Different Forms in Use.

The main difficulty in establishing a reform in the use of safety lamps in gaseous mines is in the attitude of many miners.

In Great Britain, nothing short of legal enactment forced the Davy and Clanny lamps to the wall and secured the adoption of better and safer types. It will require the same action to secure the adoption of hetter lamps in this country. The miner whose father and grandfather worked with a Davy, in most cases, helieves it to he the *only* safety lamp, and he refuses to use any other. Repeated attempts have heen made hy mine owners and mine managers to secure the adoption of improved lamps at their mines, and these attempts have been frustrated hy the miners positively refusing to use the lamps offered. The Lehigh Valley Coal Company purchased, in Decemher last, twenty-one Evan Thomas' No. 7 lamps. They were shipped to York Farm colliery, and their merits and advantages were explained to the men, hut they refused to use them. Years of practical experience have proven heyond a doubt that the Davy, the Geordy, and the unbonneted Clanny lamps are unsafe in gaseous mines, and the British Royal Commission on Accidents in Mines has officially condemned them.

The most important requirements of a safety lamp are: (1) Safety in strong ventilating currents. (2) Greatest susceptibility to the presence of gas. (3) Good illuminating power.

The lamps which most nearly meet these requirements, says the *Colliery Engineer*, are Evan Thomas' No. 7, the Mueseler, the Marsaut, the Marsaut with Howat's deflector and movahle honnet, and the Ashworth-Hepplewhite-Gray lamps. The Evan Thomas lamp is a honneted Clanny, and has proven a most efficient lamp. It gives a hright, steady flame, and will not pass the flame in strong currents. It is not easily extinguished by heing upset, nor under any ordinary conditions. Inside the hottom of the bonnet is a hrass ring, one inch high, surmounted hy a flange, which extends nearly to the bonnet. All the air passes through hetween the hrass flange and the bonnet, and thence down on the flame. The products nf combustion escape up the center of the gauze to the top. Tests with this lamp have heen made in an explosive current with a velocity of fifty-three feet per second. The gas continued to hurn in the gauze cap, and a portion of the gauze quickly hecame red hot, hut its temperature was considerahly helow that required to ignite the gas mixture. The lamp flame was in all cases extinguished in the gas mixture in a few seconds, and after an exposure of over seven minutes it showed no signs of danger. In this lamp, the quality of safety, in a preeminent degree, is comhined with simplicity of construction, and with illuminating power at least fully equal to that of any of the lamps hitherto in general use. The British Commission, in summing up its opinion of this lamp, says: "This lamp seems very safe in all currents in which it was tested. In air moving with any velocity up to 3500 feet per minute, the flame hurns very steadily when the lamp is either erect or inclined. The flame is scarcely affected by violent oscillations of the lamp or hy rapid motion up and down in a vertical direction, and it is not extinguished by inclining the lamp until the latter is nearly horizontal."

The Mueseler is on the same principle as the Clanny. There is a thick glass cylinder around the hottom part of the lamp, and this is surmounted hy a gauze cylinder. Upon the top of the glass is a ring of gauze, through the center of which a conical metal chimney is passed. The wider end of this chimney is placed just ahove the flame, and all the products of combustion ascend through it. The idea of the chimney is to compel all the feed air to come right down on the flame. It has heen found that when placed in an explosive mixture, the gas ignites inside of the glass cylinder, and as the gauze disc on top of the glass cylinder prevents the gas in the upper chamher of the lamp from being ignited, all the combustion takes place below, and the flame is either speedily extinguished, or, if it continues to hurn for any length of time, the glass cracks. If the Muesler lamp is accidently upset—which often occurs—it goes out immediately. The light given hy it is hetter than that of the Davy, Geordy or Clanny, and it has heen known to hurn in a current with a velocity of 100 feet per second without passing the flame through the gauze. It is not, however, safe to use it in such a current. The Marsaut lamp is largely used in Great Britain. It has a glass cylinder the same as the Clanny lamp, and this glass is surmounted hy either two or three gauzes, one inside the other. The two-gauze lamp gives more light than the one with three gauzes, hut there is more likelihood of the flame passing through a double gauze than through a triple one, in a current of great velocity. This lamp is honneted with sheet-iron, and it is apt to hecome very much heated if left standing at a working face where there is only a moderate current of air circulating, as the gases formed by comhustion strike against the honnet, which is in good metallic connection with all other parts of the lamp.

In all the lamps described, a certain portion of air finds its way into the upper part of the lamp without first going down to the flame. An improvement, known as Howat's Deflector, has recently heen added to the Marsaut lamp, which compels all the air to go down directly to the flame. About an inch above the glass, and over the point where the feed air enters, is a flanged ring filling up the space hetween the honnet on the outside and the gauze. A vertical ring rests on the glass, reaching up nearly to the flanged ring. The cold air, striking against the flanged ring, is deflected over the lip of the vertical ring down on to the flame, and none can pass into the upper chamher of the lamp. This deflector does not affect the safety of the lamp in any way, hut it increases the light, so that a Marsaut lamp with Howat's deflector attached gives more light than any other safety lamp. Another desirable feature in this lamp is the movahle honnet, which permits the lamp to he cleaned.

The Ashworth-Hepplewhite-Gray lamp posesses peculiar advantages as a lamp for fire-hosses. In principle it differs somewhat from those previously described. The air is fed from the hottom of two of the four standards which support the lamp, through holes in the sides of these tuhular standards. These holes can he closed, if desired, and the supply of air forced to enter at the top of the lamp, and pass down the four standards, to the flame. This lamp has a conical-glass and a flat wick, and gives a good light.

Careful research has demonstrated that in the construction of safety lamps, the hase of the gauze should he of exactly the same diameter as the glass cylinder, on which it rests, and for ordinary working at the coal face, those lamps which get their supply above the flame are preferahle to those (such as the Ashworth-Hepplewhite-Gray lamp) which are fed helow the flame. The reasnn for this is, that it requires a larger percentage of gas in the atmosphere of the mine, to show in the lamp which receives its air on the top of the flame, than in one which gets its feed air from under the flame, and if a lamp is too susceptible in ordinary working, it will rapidly heat the guaze to a degree that will cause an explosion.

The question of the illuminating power of a safety-lamp is, as mentioned hefore, of great importance. All of the lamps described are hetter light-givers than either the Davy, Geordy, or Clanny. A candle to have an illuminating power of one or unity, it has heen found by test that the Davy has an illuminating power of but 0·16; the Geordy of hut 0·10; the Clanny of 0·20; the Mueseler of 0·35; the Evan Thomas of 0·45; the Marsaut with three gauzes, of 0·45; the Marsaut, with two gauzes, of 0·55; and the Howart's Deflector of 0·65.

Another important thing to consider is the relative merits of those lamps as fire-damp detectors. Of the three old types, the Davy is the most susceptihle to fire-damp, and will show a cap of hurning gas of bluish color over the flame, when three per cent of marsh gas is present, The Muesler, Evan Thomas, Marsaut, and Deflector lamps are about alike in point of sensitiveness, and are not good fire-damp detectors. The Ashworth-Hepplewhite-Gray lamp is *par excellence*, the hest detector. In its ordinary shape it it will show a cap in a mixture of only two per cent. of gas.

The Pieler lamp, which is used exclusively for testing purposes, is practically at large Davy lamp constructed to burn alcohol, with an argand or open circular wick. The air is supplied to the inner part of the flame and enters from the bottom hy a tuhe (the opening of which is protected by discs of gauze) which passes vertically through the vessel containing the alcohol. Around the flame is a short conical chimney, open ahove and helow, and the flame is so regulated that it does not appear ahove the chimney, the height of which is from 1 to 1¼ in. The lamp is encased in a tin cylindrical hox, from which a section is removed, and in which a graduated strip of glass is fixed.

While this lamp is somewhat more sensitive than the Ashworth-Hepplewhite-Gray lamp, it is not as good for the use of fire-hosses as the latter.

It is ohvious to all who have given the question of safety-lamps serious study that the safer the lamp, the poorer a detector it is. Therefore the lamp for use at the working face should not he judged so much on its ability to detect gas as on its ahility to prevent the flame in the lamp reaching the gas outside the gauze; and the lamp for the fire-hoss should he judged on its sensitiveness comhined with such a degree of safety as will render it safe when in the hands of an official whose chief duty is to *watch it*, and who naturally devotes more attention to its behavior than is possible for a working miner to give his lamp.

The main, and only reasonahle objection offered hy miners, to the use of these lamps, is the fact that they are heavier than the Davy.

The same objection was raised against the use of these lamps by the miners of Great Britian. The experiments, researches, and investigations made hy the Royal Commission on Accidents in Mines, furnished conclusive proof of their superiority, and the dangers attending the use of the old types of lamps. The result was that a long and hitter contest was waged over the safety-lamp question, which finally resulted in a compromise, and the adoption of the following rule:

"Whenever safety lamps are used, they shall be so constructed that they may he safely carried against the air-current ordinarily prevailing in that part of the mine in which the lamps are for the time heing in use, even though such current should be inflammahle." This rule has resulted in the abandonment of the Davy and Clanny lamps in many British colleries and the addition of shields to protect them in the others which still cling to their use.

In the Bradshaw Mountains, Arizona.

OLD RELIABLE MINE, Ariz., Sept. 4, 1892.

TO THE EDITOR:—The Old Reliable group of mines is about 31 miles from Prescott, A. T. It is situated in the Bradshaw mountains, 7800 feet ahove the sea level, where there is an abundance of wood and water. Water is secured hy a pipe-line 1300 feet long. The mill runs steadily, while within a radius of 20 miles the mills are closed down on account of the scarcity of water. A force of men is working on the Old Reliahle mine under the foremanship of P. J. Hiffle, a thorough and competent miner.

Jas. R. Liston is manager of the Old Reliable Gold Works. He has had extensive experience in mining and milling in the northern part of California and all through Nevada. He has shown his ability and practical knowledge of mining by the splendid results ohtained. He has made several tests of the MacArthur Forrest or cyanide process. He saved from 90 to 97 per cent. It will he tried on a larger scale soon. F. J. GIBBONS.

ANTHONY GODBE reports that the Bullionville (Nev.) works will he ahout ready for the reduction of ores and tailings at the end of this month. The works are remodeled and simplified, and as arranged, can handle large quantities of ore and at small cost. The starting up of the plant is looked for with great intesest.

The Cyanide Process.

Cost of Working—Some Experiments with Sulphurets.

An interesting paper was read at the last meeting of the Shasta County Miners' Association hy Prof. Morton, superintendent of the Mammoth mine. A large number of memhers was present, and an important discussion ensued. The following is the paper as read hy Mr. Morton:

The discovery of cyanogen dates from about the year 1706, when Dieshach accidentally discovered Prussian hlue. Various improvements were made in the manufacture of the ferro-cyanide of potassium, hut up to 1811 its true composition and range of comhination was not understood. Then Gay Lussac showed that the salts obtained hy the action of prussic acid are compounds of cyanogen and a metal, and that it is an unvarying constituent of such compounds and is capahle of heing replaced hy equivalent quantities of other simple hodies.

Thus we find that even in the early part of the century the soluhility of the metals in solutions of cyanide was well understood. In 1839, C. V. Walker, secretary of the London Electrical Society, puhlished a work on "Electrotype Manipulation," in which he proposed using a cyanide solution of gold or silver. In 1840, Elkington obtained a patent in England for the use of prussiate of potash, meaning cyanide of potassium, however, as a solvent for gold and silver, the gilding solution to he prepared by placing sheets of gold in a solution of cyanide of potassium in connection with an electric current. In passing over the years from 1840 to 1884 we have to mention the continual use of cyanide of potassium as a solvent for gold and silver in all electrotyping works throughout the world. At times, other solvents were proposed and used, hut they were not adopted generally in the art. Tersulphide of gold has heen tried with excellent results, but, although at one time it was considered the cheaper method, still the stahility of the cyanide solution has rendered it the most reliahle and in every way the best solvent for the metal.

On Octoher 15th, 1884, Jerome B. Simpson of Newark, N. J., applied for a patent for a process for extracting gold and silver from their ores, disclaiming, however, any originality in the use of KCy. In 1886 Louis Janin, Jr., made his series of tests of the solutions of Cyanide upon ores of gold and silver, the results of which were puhlished in the *Engineering and Mining Journal* of Dec. 29th, 1888, which results were as good as any that have since heen given. On Nov. 9th, 1887, MacArthur and Forrest applied for a patent, virtually the same as Simpson's, which was not granted until May 14th, 1889. This, in hrief, is the history of the evolution of cyanogen in its metallurgical uses. I pass hy the merely tentative experiments of Faraday and Davy. We now come to the main question: Is the cyanide process a decided step forward in the metallurgy of gold?

To the entirely disinterested observer who will take the pains to examine the claims of the MacArthur-Forrest Companies and compare them with the progress really made in the United States, this question can only he met with a very decided negative.

Notwithstanding the claims for cheapness so industriously made, I find on page 20 of the annual report of the Denver Co. this significant admission: "We cannot profitahly conduct a custom mill in this city in competition with the extensive smelting plants," etc. If they cannot compete with smelting in Colorado, how are they going to get a foothold for their process in California, where the majority of paying ores carries less gold than would pay the most moderate smelting charge?

Mr. Almarin B. Paul, in his article of June 4th, published in the MINING AND SCIENTIFIC PRESS, places the actual cost of the treatment at from $2 to $5 per ton; add to this the royalty charge of $1 per ton, and it is evident that an ore must yield from $3 to $6 per ton over the yield hy the ordinary mill process before the use of this process will begin to give a profit to the mine-owner. To illustrate, referring to the Mercur Gold Co. of Utah, the statement is made, page 12 of the Denver Company's report: "This company will make payments on a capacity of 50 tons per day monthly hereafter." Let us assume that the cost of treatment by the process is $3 per ton, royalty $1, and the milling alone cost the Mercur Gold Co. $6000 per month (more than the ordinary mill process would cost). In the *Mining Age*, June 11th, the workings of the Mercur gold mine is given for May as heing 10½ sacks that netted $10,000. The product appears to have been in the form of zinc resldues that were sold to the smelting works. Now, as we have the cost of the process as given hy Mr. Paul and also by the Denver Company and the yield of the mill as given by the PRESS, we can get some idea of the amount of success that this, the most successful, if not the only successful, mill of this kind in the United States is meeting with.

Allowing that it will cost $3 per ton to mine and deliver the ore to the tanks, $3 per ton for the process expenses and $1 per ton royalty, we have a total cost of $7 per ton. In support of my deduction here made, I quote from page 12 of the Report of the Denver Co.: "We have made a contract with the company to pay us a royalty of $1 per ton on all ore treated hy them; so far we have received the sum of $2000 to he credited to royalty, etc. This company will make payments in a capacity of 50 tons per day monthly hereafter." Now, if this is all true, the Mercur Co. produced in May $10,000, out of which it should pay the Denver Company $1,500; say that their expenses were $6 per ton on 1500 tons, or $9000, the result would he a net loss of $500 cash and 1500 tons of ore as the result of the month's working hy the process.

Continuing further in this interesting report, I find on page 13 that Mr. James Duggan has arranged for the erection of a 100-ton mill in San Bernardino county, and that the Denver Company are to receive $10,000 for the county right and $1 per ton royalty on all ores treated by the process throughout the county. This mill was to have been erected at The Needles. Here was to have heen a perfect

bonanza for the Denver Company, but alas, the mill closed down after an unsuccessful run and the company will now adopt another process.

On page 14, they claim to have sold the right to the Black Hills for $25,000 and $1 per ton royalty. On page 15, they refer to a contract with Alexander Bonham by which he is to pay a royalty for the process in Boise Co., Idaho, of $10,000 and $1 per ton on all ore treated by him. Wealth, like a boundless sea, appears to be flowing in upon the fortunate Denver Co. In additinn to their own plant in Denver, five subsidiary companies were organized, and some dozen establishments licensed at prices varying from $5000 to $25,000 for county or district rights, besides the inevitable $1 per ton royalty. No matter who loses, the company has nothing to lose but everything to gain. Though they have a capital on paper of $5,000,000, it does not appear that any one has ever paid a single dollar for the stock. Of the total expense of $57,000 up to April 30th, $21,700 was obtained from the Tabor Investment Co., $20,000 from Glasgow, Scotland, at eight per cent interest, and $15,300 from county rights, royalties, etc. Still they exact their pound of flesh in the way of exorbitant charges, notwithstanding the fact that their patents cover nothing; only the use of a weak solution of cyanide, whatever that is, and a metallurgical filter composed of zinc filaments. Will some gentleman please invent a weak solution of tea to compose the nerves of fidgetty females!

But brushing aside as foreign to the subject the noisy claims of the MacArthur crowd, let us see what cyanogen is and if it is probable that it may be used as a metallurgical system.

Roscoe says, employing Liebig's classical definition: "We may say that cyanogen is a radical because:

"1st. It is an ever-varying constituent in a series of compounds.

"2d. It can be replaced in these compounds by other simple bodies.

"3d. In its compounds with a simple body, this latter may be easily separated or replaced by equivalent quantities of other simple bodies."

Cyanogen, to which the symbol Cy instead of the formula C. N. is sometimes given, combines, like chlorine, with hydrogen, and the metal and its compounds may therefore be compared with those of chlorine thus:

Hydrocyanic acid, CyH, matches hydrochloric acid, CLH.

Potassium cyanide, CyK, matches potassium chloride, CLK.

Potassium cyanite, CyOK, matches potassium hypochlorite, CLOK.

Free cyanogen, Cy2, matches free chlorine, CL2.

We have here the chemical basis of a possible method of obtaining gold from its matrix. It is settled beyond question that gold is soluble in solutions of cyanide of potassium; it is also certain that its solubility is increased by the action of an electric current. However, it is not yet known how far the presence of the base metals and soluble salts interfere with the operation but I feel certain that they do interfere sometimes to an extent that renders the cyanogen impotent, at least in a commercial sense.

Upon the ordinary auriferous sulphide of iron, or arsenical pyrites, the solution of CyK acts readily, not by dissolving the sulphuret but by attacking the gold upon its exposed edges and eating its way into the cubes by a slow advance, dissolving out the gold as it goes. An examination, with the microscope, of the pyrite after the gold has been removed, suggests the method of the operation. A sample of very rich sulphurets from a mine north of Redding was treated with a weak solution, less than two-tenths of one per cent, for 168 hours; the assay showed a complete extraction of the gold; as the sulphurets showed no change in their appearance to the naked eye some of them were placed under the microscope. I append the notes made during the examination:

"There is no change visible in the form of the crystals as a whole; along the fractured faces the mispickle looks clean and unaltered, showing the silvery white color and intense refraction of the arseoo-pyrite. Upon the faces of the crystals appear dark lines, short and parallel to each other, in places they are crowded close together; in other parts they are at considerable distances but always in parallel lines. The lines vary in length, being from four or five times to over 100 times their width; the lines are very irregular and often broken. These lines are fissures in the pyrites and extend so deep into the pyrite that the microscope does not reveal their depth. By using the higher powers the walls of one of the fissures was seen to be completely honey-combed, looking somewhat like two empty honeycombs set opposite to one another; evidently the mineral removed was crystallized along its contact walls at least. As the raw or untreated pyrite does not show any such fissuring, but upon the contrary, shows a surface marked only by striation lines common to pyrite, I assume that the fissuring in the treated sample is caused by the solution acting upon some soluble mineral, probably gold, arranged in plates, occuring in groups, but which, by its color and isomorphism and the extreme tenuity of its lines, is undistinguishable from the mass of pyrite enclosing it."

Another sample from a mine west of Redding exhibited the same general appearance, with the exception that the cavities were cylindrical and arraoged in groups; the cavities did not show any honey combing but were crossed by thin crystals of quartz. The walls of the cavities were bright pyrite.

The object of these examinations was to find out in what way the cyanide had removed the gold from an apparently unchanged pyrite. In conducting my experiments I have found a considerable quantity of the gold carried out with the soluble earth salts in the preliminary leach with clear water.

The first experiment was upon a small lot leached for three hours with clear water; the water evaporated and the salts collected. These salts assayed $310.08 per ton.

The next ten pounds of ore, fresh from the mine, gave from a three hours' leach 48 3 10 MGS of gold and silver, in which the gold weighed 22 1-10 MGS.

The last made, Sept. 1st, gave from ten pounds of ore after a three hours' leach, still using only plain water, an extraction equal to 49 cents per ton of ore.

This is a subject to be investigated much further. Perhaps I have indicated some line upon which investigation of the subject of gold extraction from our sulphureted ores may be carried on. I believe that cyanide of potassium is an effective and reliable solvent for gold under proper conditions, and that it is equally as efficient and applicable to a wider range of ores than chlorination. I do not, however, believe that it is applicable to all ores without some previous treatment by which the minerals which combine with the cyanogen shall be either removed or combined with some other element that will render them inert, just as magnesia compounds are rendered inert to chlorine by the addition of salt in roasting.

In view of the intelligent interest now being directed to this subject we may feel sure that a solution of all these questions will speedily be found, and that cyanide, as a metallurgical method, has come to stay. To be sure, many failures will ensue; the process will be adopted to work many mines, the ores of which do not contain sufficient metal to pay with any process, and people will undertake to work the process that have not the slightest knowledge of the subject, nor the skill or industrious patience that is necessary to success in any metallurgical work.

Steam on the Highway.

Peter Chalmers, a farmer of Farmington, is a genius in his line. When anything new comes out he studies to see whether it cannot be adapted to use on his farm.

For one thing, he has applied helmet oil-cups to greasing wagon-wheels. He has a score of grain-wagons, all of them supplied with these cups, and all of the wheels can be greased by means of them in ten or fifteen minutes—a job which would require an hour or more without them.

All the plowing done on Chalmers' big ranch is done with a traction engine, and during the last plowing season he ran the engine day and night, having three shifts of men. A locomotive headlight was employed to illuminate the path ahead, and another was used to throw light on the plows.

Now the farmer is hauling wheat to town with his engine. He brought a load in yesterday and stored it at the Stockton warehouse. There were nine wagons in the train, and each carried sixty-eight sacks of grain. Each sack weighs on an average 137 pounds, so each wagon-load was 9,316 pounds, and the aggregate of all the wagon-loads 83,844, or nearly forty-two tons.

The farmer has 30,000 sacks of wheat to haul, some of it belonging to neighbors.

"Is it much cheaper to bring the wheat in this way than it would be to ship by rail?" asked a *Mail* reporter of Mr. Chalmers.

"Well," was the reply, "I can't say positively that it is any cheaper at all, but I think it is. You see, this is only my third trip, and I haven't been able to cast up accounts yet. The wheat I'm bringing now comes from near Farmington, which is seventeen miles from Stockton, and it would cost $1 10 a ton to get it here by rail. Some of the wheat I'm going to haul is farther away, and to transport it on the railroad would cost $1 50 a ton. I don't think it will cost me a dollar a ton on the longest haul."

"Where does the saving come in?"

"Well, one has to load his wheat anyhow, and if ships it by cars he's got to unload and then load it on the cars. That requires men and time. This way all we've got to do is to load it in the field—the warehouse men do the rest. It requires only three men to take care of our train—an engineer, a fireman, and a man to look out for the wagons and see that they don't get 'hot boxes.' The only expense of hauling, therefore, is the wages of the three men and the cost of the coal used."

"But," said the reporter, "there's the interest on the money in the engine, which cost——"

"Four thousand five hundred."

"——And then there's repairs and the steady wear of the machine; and you've got to have a lot of money invested in wagons—you would only need a couple of wagons to haul to the railroad, but this way you need a dozen."

"Oh, I need the wagons and the engine on the farm, anyhow," was the reply.

In further conversation Mr. Chalmers said it would not be feasible to haul grain as he is doing except on level and good roads. The only trouble he experienced was in crossing small bridges, which he had to brace up on the first trip. The tender carries water sufficient for only twelve hours' consumption, but water is pumped into it from watering-troughs along the road.

It might seem foolish to say that the wagons follow one another around corners in the same path, since as a matter of course they would do so, but people often ask the farmer what sort of gearing he puts on his wagons to make them follow the lead.

The engine can haul the train at the rate of four miles and a half an hour, but to prevent jolting the speed is regulated to about three miles an hour.—*Stockton Mail.*

MR. GEORGE ATTWOOD and Mr. Reynolds of London have bought the Rattler mine and mill at Fairview, B. C., and also the Brown Bear, Ontario and Wynn, all gold properties. The gentlemen will now go to England, and, on their return, in a couple of months, will build reduction works on the properties. They have already secured land on the Okanogan river for mill sites, etc. Mr. Attwood is the son of Melville Attwood of this city, and is an experienced mining engineer, having "experted" on mines in all parts of the world. The Rattler mine belonged to Fuller, of Hannah & Fuller, Spokane, O. M. Dutton, Hank Mankin and C. C. Carr. D. A. Carmichael owned the Ontario, Joe Bromley and George Wilkinson the Brown Bear, and the Wynn M. was located and owned by Harry Simpson.

Assaying a Gold Brick.

About 9 o'clock in the morning two men entered the Mitchell building, on Third street, St. Louis, and, getting into the elevator, mounted to the sixth floor, and went straight to the rooms of the United States Assay Office. One of them carried in his hands a bundle the size of a thin brick, wrapped in paper. He laid it down on the counter in the office and slowly unwrapped the bundle. It was a gold brick. The clerk took the bullion, and, stepping across the floor, placed it in one of the pans of a large pair of scales. Then he closed the office windows and placed some weights in the other. When it balanced nicely he went to his desk, took out a blank form, and wrote to the effect that 400 ounces of gold bullion had been received from the St. Louis Smelting and Refining Works, at the United States Assay Office, to be assayed. This was signed by E. C. Jewett, the assayer in charge, and the men went away. This is the first step the government takes toward obtaining precious metal for coining purposes

It is extremely interesting to follow this process of assaying through all the steps until the value of the gold is determined and the government's check given for it. Through the kindness of Assayer Jewett, a *Republic* reporter was allowed to witness it.

While Clerk Rex was filling out the receipt Mr. Jewett explained the marvelous delicacy of the scales. Their weighing capacity is 5000 ounces, and it is possible to indicate by them a difference in weight of one gramme. To illustrate, so that this may be easily grasped, two heavy men could be placed in one of the pans, and by removing a pin from the coat of one of them the balance would be changed. Still, it would be difficult to obtain the exact weight of the men, owing to the constant change in men's bodies by perspiration and other causes.

After the bullion's weight was determined on these scales it was taken to the furnance room and placed in a black-lead crucible. This was set on a firebrick resting on a grate and a fire built around it. The fuel used is a mixture of anthracite coal and charcoal. After an hour's melting, during which time it was frequently stirred with a plumbago poker, to which gold does not cling, a sample of the metal was dipped out with an ordinary clay pipe and poured into a small mould. The assay is made from this, as it takes so much longer for a larger quantity to cool. A piece of the sample was cut off, pounded, and then rolled through a roller of tool steel, looking something like a clothes wringer, to make it thin. When this was done, Herman, the German who aids the assayer in his work, handed the thin golden strip to him, and then went back to the furnace-room to pour out the molten thousands into the big mould.

Mr. Jewett cut the strip into small pieces, and then forming little lead cornucopias of uniform weight, dropped into two of them 500 milligrammes (one-sixtieth of an ounce) of accurately weighed gold to be assayed. Into two others he put the same quantity of absolutely pure gold. Enough silver was then added to make the proportion of silver to gold two to one, as this proportion is necessary in order that the gold should separate from the silver when boiled in nitric acid.

There is in all gold a certain amount of silver and it is owing to its presence and certain other foreign substances that the color of gold varies. The idea that gold found in California or Australia is of such a color because found there, is a mistaken one.

After the silver had been added the leaded cornucopias were squeezed up and each one placed in what is called a cupel. A cupel is a little cup made of sheepbones burned to ash, ground fine, moisteoed and molded into a mold an inch long, an inch in diameter, with a cup-shaped depression at one end. The cupels were placed in a small furnace with a temperature of about 1,100 degrees Centigrade, and when heated to a white heat the little metal chunks were laid by the aid of tongs one in each cupel. They melted, sputtered, and hubbled, and then began to grow smaller. In about ten minutes they were taken out and all the lead and foreign substances had been absorbed by the cupel, leaving only the noble metals in little round balls. When these were boiled in nitric acid the silver passed into nitrate of silver and the gold was left in its pure state. By this was found the ratio of pure gold in the bullion.

The weighings of pure gold are used as a check to any peculiar conditions of heat, etc. The assayer knows the constitution, weight, and specific gravity of the pure gold used. When it is weighed, after the heating process, if it has changed weight, it is fair to suppose that it is owing to the condition of heat or strength of acid, and that the same influences have been at work on the assay gold. By allowing for this in the assay gold a true result is reached.

The next step was to find the weight of the gold and silver together. The lead cornucopias were again filled with certain weights of the pure and assay gold, but no silver added. When melted in the cupels the baser metals disappeared as before, and the gold and silver were left together. By subtracting from the weight of gold and silver the weight of the gold, the exact weight of the silver was obtained. Of course, the proportion is usually very small. If the amount is not sufficient to pay for extracting, the government does not pay for it, and charges nothing for extraction.

The entire amount of gold in the bullion is found by multiplying its weight by the proportion of the gold. This is reduced to standard or coin gold by multiplying this amount by ten and dividing by nine, as standard gold is only 90 per cent fine, and the depositor is paid by the government $18.60 per ounce of standard metal, equal to $20.67 for fine gold. The assay fee is one-eighth of one per cent of the total value of fine gold, the melting fee is $1, and the alloy charge about one cent on a hundred dollars, and after this is deducted the assayer hands a check to the owner of the gold. The entire time occupied by this complicated operation was from nine A. M. until one P. M., only four hours.

Mechanical Progress.

Sound Talk to Shop Hands.

As workmen, how many of us are what we pretend to be? How many of us ask to be rated for the real value that we render, rather than for some circumstance not connected with such value? How many of us expect to be judged for some one or two showy hits of practice that we may excel in, believing that the glory from them will brighten the many weaker spots in our workmanship?

Some of us are old hands in the shop, and as such expect to have a higher rate of pay and the privilege to do less work than the newer hands. Does the employer get more money for an old hand's work than for a new hand's work, quality for quality? Some of us served an apprenticeship in the shop, and deny the new hands from other shops, of equal producing power, the right to earn the same wages we ask or get. Some of these days we may travel and then we will see the injustice of this when it is applied to ourselves.

How many of us by being careful, close-mouthed, open-eared, slow and painstaking, get credit for workmanship that is not our due, and cash equal to men of long experience, many resources and correct practice? Such is the value of dignity and the appearance of seriousness to a man that one who possesses these qualities is always respected beyond his merits, or perhaps it is that a good workman who gives his superiors the opinion that he is not in earnest, is always rated below his deserts. Perhaps it will pay some of us to think of this subject.

Do not some of us in our working hours go along with our work in a perfunctory way as a matter of habit, while our minds are studying private inventions, music or some other art having no connection at all with the job being done? Now machinery can be made, and is being made, to do all that such of us do who do that, except, perhaps, the complaints we make that other men are favored beyond us, and that we are continually slighted.

Do not some of us get less money per hour than we should get, for the reason that we have a habit of taking a day off whenever so inclined, and cannot he depended on to be at our post every day possible, without considering whether our work is needed or not, and without the formality of an interview with the foreman on the subject prior to the absence? The writer always insisted on his employers paying him his wages at stated times, and of their fulfilling all their obligations to him. To give them no excuses for delinquency, it was his practice to do with them as he had agreed. But some of us insist still more energetically on our strict rights, while we utterly fail in filling our side of the contract.

Do we not often waste 15 minutes or more a day which should he occupied in producing something? For instance, in chat with a friend on outside matters, or a little lounge about the shop after one job is finished and before another is begun? Now suppose your pay was dishonestly withheld, say about 50 cents a week, what would you do? Would you grin and bear it as the boss does about the stolen time?

Do not we believe that for every dollar we increase the value of our services that we should get about 50 cents of it? And is it not a fact that when we get to be able to do more good work every day, we have but little difficulty in getting more pay for it, and as much as 50 per cent of our increase? Which of us is retained in slack times? the "cheap jack" or the expensive mechanic?—Manufacturer and Builder.

THE HARVEY CARBONIZING PROCESS.—The Harvey process of case-hardening which bas been so successfully applied to giving a bard surface to armor plates is as follows: The plate to be treated is made out of mild steel containing, say, 0.10 per cent to 0.35 per cent carbon, and after being formed to its final shape is laid flatwise on a bed of finely-powdered dry clay or sand, which is deposited on the bottom of a fire brick cell or compartment erected within the heating chamber of a suitable furnace. The upper suface of the plate is then covered with powdered carbonaceous material, which is tightly packed. Above this is a layer of sand, and over the sand is laid a heavy covering of firebrick. The furnace is then lighted and raised to a temperature sufficient to melt cast iron, and this heat is maintained for a greater or lesser period, according to the amount of carhonizing to be effected. About 120 hours are said to be required for a plate 10½ inches thick. On removal from the furnace such a plate is found to have had the composition of its upper surface changed. At a depth of about three inches from the surface tbe percentage of carbon has been raised by about 0.1 per cent, which increases progressively as the outer surface is neared, when the amount of carbon may rise to one per cent. It is said that this process, though, as will be seen, it resembles the ordinary cementation process, does not cause any blistering of the surface of the plate. This the inventor attributes to the high temperature at which it is carried out; but it is also suggested that the absence of hlisters may be due to the homogeneity of the metal, which, unlike the wrought-iron bar used in the cementation process, is free from cinders.—American Manufacturer.

Tightening Pulleys.

Tightening pulleys is sometimes a necessary evil, and like all other evils should never be tolerated nor indulged in except when actually necessary. The life of a belt is almost sure to be shortened when a tightener is used on it, as the operator can he depended on to work the tightener hard against it whether required or not, and right there exists the great evil. If well enough is or could be let alone, and the tightener used in moderation, it would not prove so bad an agent on general principles. But that is it; well enough, or taut enough, is never let alone. The tightener's presence is a constant temptation to do wrong by forcing it against the unoffending belt; besides, what is a tightener for, anyway, if not to tighten the belt? And so one gives the wheel another turn or the lever another notch.

But, nevertheless, tighteners have sometimes to be used to make belts already in operation do the work required of them, or else a rearrangement must be made which implies a good deal of expense, and to avoid that the tightener becomes a necessary evil. Tighteners are mostly required in cases where belts are runniug on pulleys largely differing in size, and they should be run near to the smaller pulley, wbether it be the driver or driven, provided, of course, it is practicable to do so. There may be cases where the tightener cannot be applied close to the small pulley. The object of having the tightening pulley close to the smallest of the two pulleys is to use it for the purpose of increasiog the lap of the belt on that pulley. When great variation in the diameters of the pulleys exists, there is an excess of lap on the large pulley and a deficiency on the small one.

Therefore, if the tightener is used for equalizing the lap, the difficulty will be overcome without having to work the tightener very hard against the belt. The belt is put on slack, and the tightener is used for taking up the slack, and at the same time forcing the belt farther around on the face of the pulley. If by that means the arc of contact on the small pulley is made equal to that of the large one, the belt will adhere as tenaciously to the small as to the large, and will at once cease slipping.

When both pulleys are the same or about the same in diameter, then the arc of contact will be about the same, and the tendency to slip, if any, will be about the same on both. In such cases the location of the tightener is immaterial. It may be close to either the driver or driven, or half-way between, as convenience may dictate. Never fail to have the tightener on the slack fold of the belt.—Mechanical News.

Crucible Steel for Boiler Plates.

Since the discussion at the Master Mechanics' Convention on boiler steel, and tbe impression given out that some crucible steel sheets bad given extraordinary mileage in fire boxes, there has been a tendency to regard crucible steel as heing particularly valuable for boiler purposes. We believe that this impression is at best a fallacy, and that there is no kind of steel so well adapted for fire-boxes as the open hearth steel that is commonly in use. It seems certain that the tendency to break down prices has brought into the market steel of inferior quality, which is not well adapted for use in fire boxes. Many railroad officers are now saying that they are prepared to pay any reasonable price for good boiler steel, and their eyes are turned toward crucible steel as the material that is going to realize all their expectatioos. We would caution our frieods not to he precipitant in employing this material for fire-boxes. Those who are considering the merits of crucible steel will do well to study a report that was submitted to the Master Mechanic's Convention in 1888. In that report the following points were made ahout crucible steel:

"The crucible process of making steel is the oldest, commercially speaking, and for some purposes the best—that is, when steel is wanted in some small quantities of considerable purity. It is a failure when large masses of homogeneous character are required, as is the case in boiler plate. Its shortcomings in this respect are due to the process of manufacture, which, as is well known, consists in melting wrought-iron, etc., in a crucihle holding generally from 80 to 125 pounds. To obtain a mass large enough to make boiler plate, it is necessary to pour the contents of 20 to 50 crucihles into one mold to form an ingot. As the "steel" is made in each crucible, it follows that in 30 crucibles we have 30 different kinds and grades of steel in the one sheet. Tbe result, when subjected to the trying conditions found in a locomotive fire-box, is, of course, disastrous in the majority of cases, as homogeneity or absolute uniformity of the metal in this service is one of the most important elements found in long-lived fire-boxes."—Locomotive Engineering.

Scientific Progress.

Accumulators in Telegraphy.

In a paper recently read before the British Association, Edinburgh, Mr. W. H. Preece described the method of working telegraph wires from accumulators which has been in use in the London office for the past seven years.

Accumulators supply current to two large groups of circuits, one group consisting of 110 single needles and the other of 100 Morse inkers and sounders.

To provide a ready means of replacing the battery in case of failure, the leads from the working and reserve cells are first led to the test-board in the instrument-room and there joined to a switch, thence the leads are again led to the test-board in the battery-room, where the two groups are split up into subgroups of ten circuits each. The connections are made in this manner for two reasons: first, for facilitating a change of a faulty battery, and second, to prevent a general stoppage of the whole group in the event of a short circuit at any one of the instruments; the resistance of the leads between tbe instruments and subdividing connections in the basement being sufficient to prevent more than three amperes being taken from the battery by any one of the instruments, even when a short circuit is on. To prevent any damage to the instrument, or risk of fire, fuses are placed in the battery leads at each instrument. The circuits on the groups mentioned are all metropolitan, and are all, approximately, of the same resistance, no equalizing resistances being, therefore, necessary. The current in each circuit ranges between 17 and 20 milliamperes. The E. M. F. for the single needle is 20 volts—10 cells positive and 10 negative, with earth in the centre. For Morse-working, the E. M. F. is 18 volts.

A considerable extension of the accumulator system has recently been made. Since October 17, 1891, the whole of the continental circuits from the general office have been operated by currents from secondary cells. There are 59 continental circuits, and these are divided into four groups, each circuit taking a current of 100 volts.

All the cells are kept well-charged, and the E. M. F. is not allowed to fall below 1.95 volt per cell.

Accumulators are also used for working the telephone circuit in Paris. Their E. M. F. is so constant that they are fouod to be eminently adapted for the purpose.

LIQUEFIED AIR AND OXYGEN.—Prof. Dewar gave a very ioteresting lecture at the Royal Institution recently, on liquefied oxygen and liquefied air. He produced both liquefied oxygen and liquified air, the oxygen in pints, and even the liquefied air was handed round in claret glasses. Liquid oxygen boils in air at —182° Centigrade. The liquid oxygen placed between the poles of Faraday's great magnet behaved like a metal, leaping up to the poles and clinging to them till it disappeared as gas. But liquid oxygen, though so strongly magnetic, is a very bad conductor of electricity. It is a nonconducting magnet. He showed too, that so far as chemists can judge, there is probably no oxygen in the sun—the oxygen of the earth's atmosphere accounting for all the oxygen lines in the solar spectrum. The boiling point of liquid air is —192° Centigrade, or 10 degrees lower than that of oxygen. It is not true, as had been supposed, that the oxygen io the air liquefies before the other elements in air; on the contrary, the air liquefies as air, and is not resolved into its elements before liquefying. If this globe were cooled down to 200° below the zero of Centigrade, it would be covered with a sea of liquefied gas 35 feet deep, of which about seven feet would be liquid oxygen.

What Are Diatoms?

The plants in question are so small as to be seen only with the aid of the microscope; those of ordinary size, when magnified about 350 diameters, appear about a quarter of an inch long. Others are much larger. They are curious little plants with a silica shell, which, in certain places, is provided with little apertures through which living parts of the plant protrude. In this way they are enabled to move about freely in tbe water by which they are generally surrounded, for, though they are not all strictly water plants, they all need considerable water to enable them to thrive, and so are always found in wet places.

Owing to their freedom of motion, they were at one time supposed to be animals. Now it is known that they are plants, as they can perform all the functions of plants, and no animal, with all his superiority, high nature, etc., is able to do tbis. They are found everywhere in all inhabited countries, and in fact all over the seas. So it may be readily granted that a plant so common and widespread as this should be quite familiar to every one.

Again, not only are the living plants so widespread and common, hut the shells of the dead ones remain intact for many years; and in certain localities these tiny shells are so numerous as to form a large portion of the soil. Some of the best known of these localities are the sites of Richmond, Va., and Berlin, in Germany.—Emily L. Gregory, in Popular Science Monthly.

PLATINUM.—An American traveler, who has recently returned from the Urals, reports that he found that the stories about the scarcity of platinum circulated about two years ago were false, and that the increase in price was due to a combination between the English handlers of the ore and a broker in St. Petersburg, who, together, managed to control the production and get up a corner. The price of platinum went up to $19 an ounce, but could not be maintained, because a number of new mines were quickly opened, and the production was largely increased. There are now, at least, 40 mines along the course of a river in the distance of 50 or 60 miles. The ore-grains are obtained from their native sand by crude washing in tubs, provided with dashers like butter-churners. It is primitive work at the best, although some of the mine-owners employ steampower to agitate the dashers, and nothing but the extraordinary weight of the platinum prevents a serious loss in washing. After the grains are obtained, they contain from 50 to 70 per cent of pure aluminium, combined with iron, gold, osmium, iridium, and other metals of this group. The sand-ore undergoes seven operations before tbe platinum is technically pure. This purification, bowever, is not performed at the mines, but at a works in Germany, where the work is superintended by a trained chemist and assayer, who acts also as bookkeeper, and receives an equivalent of a guinea a week for his work.

THE MOST USEFUL MINERAL IN THE WORLD.—If one were to ask his friends what mineral we are most familiar with and most commonly used as food, the answers would probahly be both varied and amusing. Salt would, I fancy, first suggest itself to many, and to those whose training in physiology and hygiene has not been neglected, no doubt the claims of lime and iron and carbon, which, in one form or another, we use with food to build up bone and brawn, would he amply urged. But after all, it is water, for water is a mineral—a fused mineral. You will find it described as such, along with quartz and topaz and the diamond, in Dana's *Mineralogy*, or in other treatises on stones. We usually think of minerals as solid things, such as metals and rocks and jewels and various chemical salts. But when we consider the matter a little, we see tbat all these things, if melted by strong heat, are minerals still, only they are now in a fluid instead of in a solid state. The difference between these minerals and water is that water gets fluid at a lower temperature than they do, and, like quicksilver, stays melted at ordinary living heat; but in those old ice ages which, one after another, have swept now over the northern and now over tbe southern hemisphere, bringing ruin and desolation, the natural and common condition of water was that of a solid—ice—as it largely is to-day out of doors in winter when not kept fused by the stored-up heat of the soil and rocks or melted by the sun.—Harper's Magazine.

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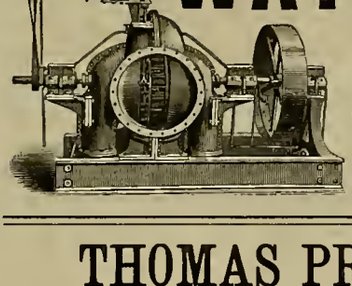

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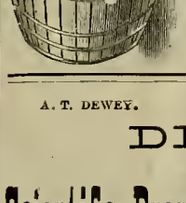

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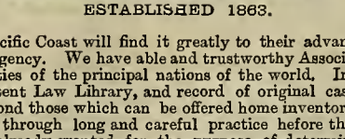
Scientific Press  Patent Agency.

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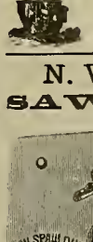

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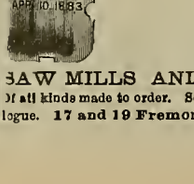

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Electricity.

The Electric Trust.

The recent combination of two of the largest electrical manufacturing companies in this country has been looked upon generally as foreboding no good to the electrical industry, and many of the subsequent proceedings of the trust give color to this view.

A combination of capital to control any branch of business is an aggression upon public rights, and an unscrupulous attack upon the pockets of the consumers of its products. Although a benevolent motive is always claimed for the perpetration of these outrages upon public justice, the invariable but nonsensical claim about cheapening the the cost of manufacture and the consequent reduction in price to the consumer is the text of the defense of these organizations. The effect of competition, which would otherwise exist, is not considered.

The effect of a monopoly in the electrical manufacturing business would be especially unfortunate, as such a condition would result in bringing the present rapid progress in the perfecting of electrical apparatus to a comparative standstill; competition being the great incentive to improvement and invention in any line.

It is essential that the inventors should feel the demand for their work in order to stimulate them to greater efforts, and the rapid progress which electricity has made beyond other sciences is undoubtedly due to the vigorous competition which has characterized its progress from the day of its commercial adaptation.

It is fortunate for the public, however, that no such contingency as a monopoly in the electrical business is to be feared, and the high-handed proceedings of the trust have not met with the success which its officers could desire, especially in the direction of consolidating the local lighting and power stations and the various supply companies.

Although it has been given out in the associated press that the Edison and Thomson-Houston Illuminating Companies throughout the country would be combined, where two or more existed in one city, no foundation for such a statement exists. These local companies are, with few exceptions, independent of the parent companies, and where a station has not been so designed as to be dependent upon a certain make of machinery, it is at perfect liberty to combine or not, as it sees fit. The above statement was but a piece of irresponsible prophecy, inspired by the hopes of the trust, but its fulfillment does not seem to be an immediate probability, judging from the dissatisfaction of the local companies, expressed at their annual meeting at Toronto.

With the characteristic greed of a combine, bills have been rendered to these companies for many things which had not been charged for under the old regime, and many of the perquisites of the Edison companies, which their contracts assured to them, were curtailed, much to the disgust of the local companies, who claimed, and rightly, that the change in the organization should not affect their original contracts.

The attempt to include the supply houses in the combine was a signal failure. The invitation of the trust to these concerns to be swallowed up was universally declined, and now this $50,000,000 corporation is attempting, by means which other trusts have found so effective, to drive their smaller competitors to the wall.

It is generally conceded by the public that the man with $1,000 000 or $2,000 000 has the right to exist and carry on a business, even in competition with an incorporation of $50,000,000 capital stock, including the water, and it is difficult to see how this freeze-out system can prove very harmful when there are 20 or more competing manufacturing companies in the field. This style of robbery needs an exclusive monopoly to insure its effectiveness.

As the trust has by no means a monopoly, but only a moderate fraction of the electrical business of the country, it is hardly probable that their manufacturing business can pay heavy dividends on such an amount of capital stock; but a branch of business which is often found profitable in combinations and trusts is the speculation in the stock of such companies by those who are in a position to properly manipulate it, and the fluctuations of this stock will be a matter of general interest, as an index to the policy of the trust in this respect.

This trust has also shown its hand, and follows in the footsteps of all such infamous combinations, by making a decided raise in the price of its apparatus. This has reacted against the aggressors, however, by considerably increasing the business of their competitors and causing dissatisfaction among former customers; but higher prices invariably follow combinations to "decrease the cost of production."

Another point on which great stress is laid is the patents held by the combined companies, which are certainly numerous but practically of little importance as far as fundamental principles are concerned, and there is no impediment in the way of operating a practical and efficient lighting or railway system. In fact, many of the machines now manufactured by the trust could be practically duplicated without infringing any patents; but such a task would hardly be attempted by one well informed on the designing of electrical machinery. The fact, however, that such a number of companies are engaged in the manufacture of practically similar machines and apparatus leaves nothing to be feared on the score of exclusive or fundamental patents.—Electricity, New York.

Electric vs. Steam Roads.

In an article in a recent number of the *Railroad Gazette* on electric and steam traction for suburban and through lines, not car-line traffic, the writer reaches the following conclusions:

1. There is no prospect for electricity replacing steam for long-distance freight traffic.

2. There is a possibility of electricity becoming an economical substitute for steam locomotives for high-speed service, wherever the traffic is sufficiently heavy and constant to warrant the construction of lines of track independent of those used for moderate speeds.

3. There are very few localities in the United States in which the conditions are such as to make such a substitution commercially possible, with the efficiencies at present obtained with electrical machinery.

4. If the electrical equipment could be purchased at reasonable prices, there are a few short lines of steam railroad on which the passenger traffic is such as to make electricity a possible form of motive power at present speeds.

5. It is probable the electric locomotives will be used in tunnels and for switching in cities where freedom from smoke is important.

6. No electric motor capable of doing the work of a medium-weight steam locomotive has yet been constructed.

The first conclusion is evident from the fact that the cost of the conductors for the electric current and the loss on the long lines due to leakage and resistance would more than offset what might be gained in the fuel saving. The second conclusion is also evident, except that part calling for independent tracks and for high-speed traffic. Why the traffic must be independent is not clear, as all that is needed is a clear track, and that can be had with slow or high speed trains. Perhaps a constant speed may be an essential condition, but it may be high or low and yet be constant. So far, the above-quoted journal says, electric construction companies have been simply talking, and in that they contrast strongly with makers of other mechanical innovations, who do, as a rule, make a try at a job at least before they talk of the wonderful possibilities of their devices. But to do them justice, we should say they are working in good faith, only they prefer that some one else should pay the cost of making expensive experiments. The Baltimore and Ohio tunnel job will give them a chance to show what they can do, as the horsepower required to haul the proposed trains at the proper speeds up the given grades, viz., 1200 tons at 15 miles an hour and 500 tons at 30 miles an hour up a 42-foot grade, is about 950. This is certainly enough to commence on.

Electric Wiring Specifications.

The growing stringency of insurance rules for the installation of electric light wires, and the demand for sightly and thoroughly efficient work, would be a matter of less concern to electric light contractors if architects and builders would recognize, or be brought to realize, what important factors they are in the matter. As it is, very rare instances do architects' plans and specifications contain any of the provisions that would not only lessen the difficulties of the electrical contractor, but would enable him at the same time to execute a job in exact accordance with the spirit of insurance rules and in a workmanlike instead of a necessarily makeshift and unsightly manner. As a rule, says the *Electrical World*, the builder seems to think that running the wires is merely a question of somehow getting them in place; and unless a close watch is constantly kept, the electrical contractor finds himself left on the outside of finished work with a quarrel on hand as to who is to stand the expense of renewing the work after the wires are installed. While the matter of channeling the walls for risers, providing hollow cornices, distributing closets and a few other details might not be beyond the reach of some architects, upon the whole the quantity of details to make a satisfactory installation is such that the services of a specialist are necessary when the work is at all important in extent or character. The logical solution of the difficulty is to employ an electrical engineer to draw up the wiring plans and specifications, and for the architect in turn to provide for the conveniences these call for. The contractor would thus find his path less rugged mechanically, his apprehensions on the score of the insurance inspector less disquieting, and, moreover, have the support of the architect in restraining the "previousness" and hostility of the builder. It is to be feared that this idea would not be viewed with favor by many all-sufficient architects, but the enterprising electrical engineer, by bringing it to the attention of the owners at an early stage of the work, would not only benefit himself but the profession at large, and should receive the indorsement of underwriters' associations in his endeavors.

Useful Information.

Portland Cement.

Portland cement, contrary to an opinion very commonly held, is, comparatively speaking, a modern invention. The first factory established was on the Thames, in England, and the process was so crude and the demand so small that up to 1850 only three factories were in operation. At present nearly 8,500,000 barrels of cement are made in Great Britain each year, and the annual production in Europe is over 20,000,000 barrels. The process is much the same at present as it was 20 years ago.

In England, the raw materials are chalk and clay, both very pure, and even with inferior processes they make a very satisfactory cement. Portland cement was imported into the United States as early as 1868. In 1882 the amount imported was 370,000 barrels, while at present it exceeds 3,000,000 barrels a year. American manufacturers of Portland cement are at a disadvantage on account of the character of the material used in this country and the difficulty of handling the same.

The American process requires about eight days, and demands great care to produce a uniform product; and yet great improvements are in progress. The processes used in the Portland Cement Works at Copely, Pa., for example, bid fair to revolutionize the science of cement-making. At the factory, the raw compound is burned in a powdered condition while traveling in an inclined hot-air furnace, through which is passed a hot petroleum flame, and a few hours is sufficient to finish the process. The resulting cement is of excellent quality and is guaranteed at very high figures.—Manufacturers' Gazette.

MACHINERY AND LABOR.—The *Manufacturers' Gazette* says: Most of us can remember when the laborers in some of the Western States were burning or otherwise destroying the reapers and binders used in the grain harvest, or boycotting the farms where they were used, because they were depriving the poor man of his employment. Now they say that 44,000 laborers are wanted and cannot be obtained to harvest the crops in Minnesota and South Dakota. The introduction of machinery so changes conditions upon the farm, as in other business, that any lack of employment is likely to be only temporary, and as soon as conditions are adjusted more business is done, more help employed and higher wages paid. The spinning jenny, the loom, and the whole history of the rise of steam power prove this. In fact, the increased use of machinery and the improvements made, means the production of goods at lower prices, and their increased consumption by the poorer people. When our grandfathers bought seven pounds of wheat flour at a time, twice a year, or at Thanksgiving and Christmas, machines were not needed to harvest the wheat crop. Rye and Indian bread was used then.

IN 1790 three patents were issued. One hundred years later the number was 26,292 The total number of patents granted during the 100 years was 453,944, or an average of nearly 13 patents for every day.

NUMEROUS experiments to determine the best fire-resisting materials for the construction of doors proved that wood covered with tin resisted the fire better than an iron door.

Assessment Notices.

NOTICE OF ASSESSMENT.

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Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of August, 1892, an assessment, (No. 3) of One Dollar ($1) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room 43, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of September, 1892, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 18th day of October, 1892, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

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Table of Contents.

The following brief abstract of the contents will give an idea of the branches of the subject treated:

General Plan; Discussion of the Principles of Hydraulics; Rules Deduced from Formulæ Obtained; Examples and Calculations; Extensive Tables for Ready Reference; Fundamental Laws of Hydraulics Demonstrated and Expressed in Formulæ and Rules; Flow of Water through Openings; Weir Coefficients; Triangular Weirs; Flow of Water Over Quadrant Weir (tabulated); Application of Tables; Submerged Orifices; Flow Through Orifices in Thin Partitions; Tables and Applications; Miners' Inches; Tables and Calculations; Flow of Water Through Short Tubes and Compound Tubes; Flow of Water Through Pipes; Tables of Velocities and Cubic Feet Flows for Given Fall per Mile and Diameter of Pipe; Coefficient for Bend—Circular and Angular Flow Through Nozzles; Inverted Siphons; Flow of Water in Open Channels; Extensive Tables; Rough and Ready Notes; Hints for Speedy and Approximate Estimates, etc.

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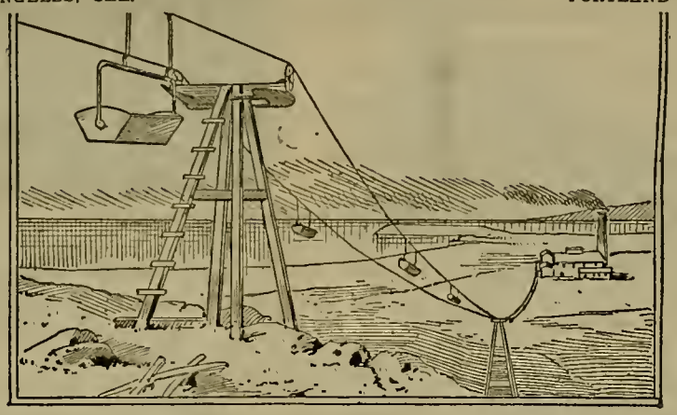

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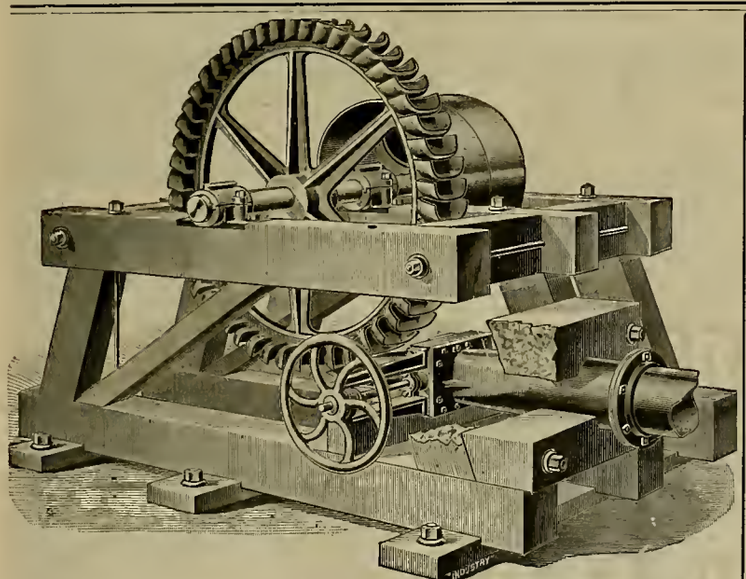

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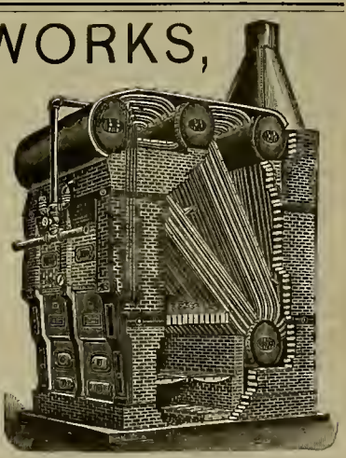

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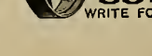

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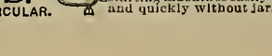

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Cholera Germs.

At the last meeting of the San Francisco Microscopical Society two papers were read on the cholera. The first was by Henry E. Sanderson, M. D., on "The Spirillum of Asiatic Cholera," and the second by R. H. Freund, "A History of the Cholera Organism."

Dr. Sanderson prefaced his paper by a brief account of the method pursued in laboratory work, with cultures of cholera and other disease germs. He said he had no doubt most of his hearers were already familiar with the methods, but for the benefit of his lay hearers he exhibited the various articles used and some of the apparatus.

In 1829-37 Europe, he said, was for the first time attacked by a hitherto unknown disease, which spread with great rapidity over the continent. It came originally from Asia, from the region of the Ganges delta in India, hence the name of "Asiatic cholera." It has since reappeared at varying intervals and has done its deadly work, but for many years its cause was but a mystic conjecture.

In 1883, as the epidemic again spread to the confines of Europe and threatened to cross the borders, the German Governmeot sent a commission to the infected regions to investigate the disease, and especially to search out the causative factor. At the head of this commission was Dr. Robert Koch, who discovered in the discharges the germ since known as the comma bacillus.

In bacteriology there are three forms of vegetable life; the bacillus or rod-shaped, the micrococcus or berry-shaped and the vibrio or spirillum, the spiral-shaped. The cholera germ belongs to the vibrio spirillum group. Some are very slightly curved, others more markedly so. It is ooe-half the length of the Tubercle bacillus, much thicker and has rounded ends. Some are so much curved as to form almost a semicircle and occasionally, where two or more are joined together, a spiral or letter S form results. Where marked spirals occur it is due to peculiar circumstances, such as restrict the ordinarily quick subdivision, by means of which multiplication occurs.

The germ is very active in its movements. In proper culture media and with proper temperature they swim and wriggle around the field of vision like a swarm of gnats. At one end of each is a whip-like process or flagellum, by means of which this motion is induced.

The question as to the existence of spores is not yet definitely settled. No one has ever been able to prove their presence by staining methods. Hueppe claimed to have seen sporuration taking place in a hanging drop, but his observation has not been confirmed. In order to prove the existence of spores in bacteria it is necessary to prove the existence of forms with far greater resistance power than that possessed hy the bacteria themselves. No such enduring forms have been found in connection with the cholera germs. On the contrary this germ is among the most sensitive microorganisms koown. A temperature over 122° F. kills them quickly. They stand chemical influences very poorly, especially mineral acids. The hydrochloric acid of the gastric juice kills them, and if the gelatine-culture shows a trace of acid the culture will fail. Dryness kills in a short time, sometimes in a few hours, while in fluids they remain virulent for months. Other bacteria easily overpower them, and in putrefying fluids the germs of putrefaction are apt to kill them.

In artificial cultivations, as a rule, the free entrance of atmospheric air is required, though under some circumstances thriving without it. In the intestinal contents of man they thrive without atmospheric oxygen, but produce oxygen from the chemical changes induced by themselves. With a temperature under 50° and over 107° F. they do not flourish.

The method of infection of the general system seems to be somewhat misunderstood, if one judges from newspaper articles which have lately appeared in this city. The bacteria themselves do not get into the blood and the various organs of the body, but remain confined to the intestinal contents, with some invasion of the intestinal walls and occasionally of the intestinal lymphatic glands. From the intestinal tract absorptions of poisonous substances produced by the bacteria into the system at large, absorption of the "toxines," or *tox albumens*, and the consequent poisoning, is what gives the symptoms of the disease; although the thickening of the blood and the terrible drain upon the system from the copious evacuations does, also, great injury.

There are several other bacteria which look under the microscope very much like the vibrio of cholera, and these were very fully described by Dr. Sanderson. He had also placed under microscopes for inspection preparations of the cholera germ and these allied forms, all of which were closely observed by those interested in the paper. He gave a full description of the methods of culture of these various germs, the media employed for the most perfect and rapid development of each, and much valuable information.

Bathing, and Why We Should Bathe.

Among all the appliances for health and comfort to mankind, we may safely say there is nothing so well known, so useful, and withal so comforting, and yet so little practiced, so carelessly and thoughtlessly neglected, as judicious bathing. The skin of the human body, from head to foot, is a network of pores, which ought always to be kept free and clear of obstructioos. These pores are the openings ioto minute tubes or channels, which lead through unseen meanderings into the sanctum of life within.

To those blessed with good health. a bath, as a commonsense appliance, gives thrift and growth to healthy functions, a brightness and delightful serenity, a clearoess of mind and buoyancy of spirit. It is certainly a blessing to both mind and body. For the mental worker, it is a nerve tonic. A thorough immersion in water of proper temperature will calm and give strength and tooe to his whole system. The indoor laborer who gets but a scanty supply of fresh air, needs a bath to obtain those invigorating elements so common in the open air.

The outdoor laborer—especially the farmer—who works with heroic energy all day long, unavoidably gathers on the entire surface of his body a complete prison-wall of dust and thickening, gummy perspiration, and when his day's work is done, he needs then, more than any other thing, not only a wash, but a good, luscious "full bath," to fit him for a clean bed and a refreshing sleep.

The glutinous mass of perspiration, dust and filth, which gathers on the surface of the body, naturally covers and clogs the pores and often enters them and poisons the system. To remove that filth, frequent ablutions and occasional immersion in water are exceedingly desirable, and usually indispensable to health and comfort; consequently, every family should have a convenient bath, and a full bath, too, of some kind, not only for general neatness of person so desirable to every individual of taste and culture, but as a means of preserving health, and in many cases, especially under the advice of a good physician, as the safest, pleasantest and one of the most powerful and efficient means of combatiog disease. Directed by good judgment and wise counsel, a hath is a valuable auxiliary to other remedies, and it can be used when internal remedies cannot. In the long catalogue of diseases to which flesh is heir, scarcely one can be named in the treatment of which a bath is useless. In an emergency, which often happens when least expected, as in cholera, cholera infantum, cholera morbus, cramps, fits, etc., a pliable, portable hath, which requires but little water, ready just at the right time, may save some precious life.

Finally, every one needs a bath at times, and every human habitation should contain something that will serve to secure a complete immersion in water, and since convenient and efficient portable baths at comparatively low figures are now extensively advertised for sale, there is little excuse for any one to be without this priceless benefit. Manufacturer and Builder.

MECHANICAL PROPERTIES OF SOILS.—The property of absorbing and retaining moisture is important. Clay loams and peaty soils absorb the largest quantity of moisture and retain it best, especially those peaty soils which have a large excess of organic matter in them. Pure clay soils are generally too compact, while sandy soils are too loose either to absorb or retain moisture. On level clay soil the water will stand and become stagnant. This is the case also with sandy or peaty soils with a clay subsoil. Under these circumstances draining is necessary. The air should be allowed to circulate freely through the soil. It carries the elements of plant food contained in it to the roots. Carbonic acid gas and ammonia are both furnished in this way to a considerable extent. It promotes the decay of vegetable matter present, and thus again provides food for plants. The proper chemical changes in the mineral elements of the soil are promoted by the carbonic acid and the oxygen of the air. How necessary, then, that the soil should be well plowed and well pulverized.—Florida Farmer.

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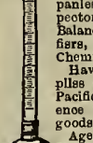
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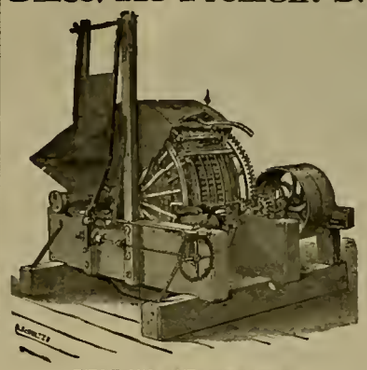

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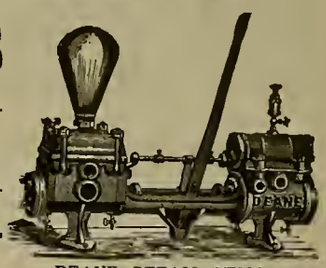

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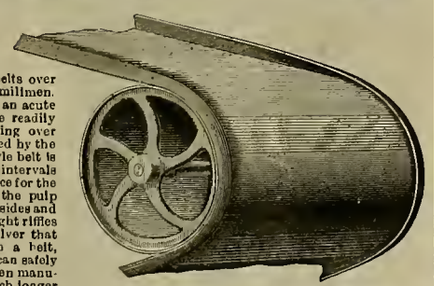

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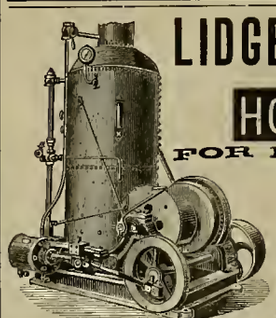

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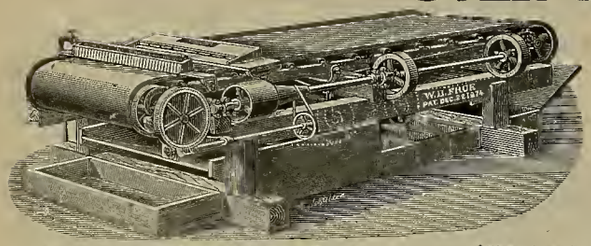

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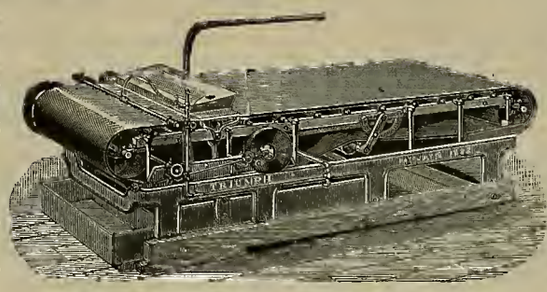

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GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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Signed] Sup't North Star and Original Empire Mining Co.

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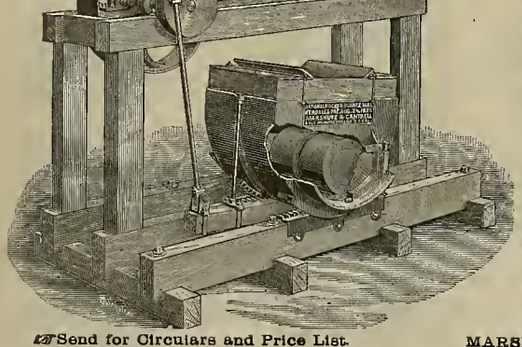

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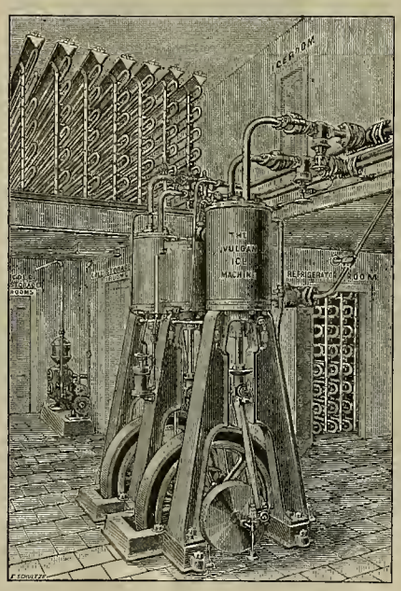

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Mining Summary.

The following is mostly condensed from journals published in the interior. In proximity to the mines mentioned

CALIFORNIA.

Amador.

SHUT DOWN.—Amador *Ledger*, Sept. 17: The Clinton Consolidated mine was compelled to shut down Monday night on account of the scarcity of water. The company intends to make some needed improvements to the old shaft and sink it 200 feet, and will add to the mill ten more stamps. To perform this work they have decided to retain in their employ the married men.

KENNEDY.—The steady work of the Kennedy mine for several days previous to last Monday exhausted the water in the reservoir to such an extent that Monday night's run was made with steam to allow the water supply to accumulate.

SUTTER CREEK.—Mining is moving along in the usual prosperous way. At the Hector all is life. The ore-bins are nearly all full of ore. Almost everything is in readiness for starting the mill. The force of men in the mine is being gradually increased, and it will be only a short time when a sufficient number will be employed to keep the 40-stamp mill going steadily. Mr. Valentine is having everything arranged for convenience and dispatch and of the most modern style. From present appearances it will be but a short time before the Hector will be one of the best-equipped mines in the county. At the Wildman occurred a slight accident last week. The 11-inch pipe which runs the hoist broke a short distance from the works. The 30-stamp mill is kept running steadily and the last clean-up was the largest had for years. Crosscutting west in the South Eureka has been abandoned. About 300 feet from the shaft they found some ledge matter bearing some gold, and they think that by drifting on the vein it might develop into a good-p ying body. But they have turned their attention to the east ledge which is evideotly the main channel, and are drifting north and south. They have enough already in sight to convince them they have a good mine. A month or six weeks more drifting on the ledge and they intend sinking 300 or 400 feet deeper, at which depth they feel very confident of the development of one of the best mioes in the county. The Belmont is moving along in about the usual way. They are getting out rock and expect to start the mill in a very short time. They are considerably hampered on account of their hoisting machinery, everything being done by whim. The movement is extremely slow and the power is altogether inadeqnate. Mr. Tibbetts is qnite hopeful of having a small engine put in before many weeks and one of Knight & Co.'s water-wheels, which would facilitate the developmeot of the mine materially. Surface work at the Lincoln has come to a permanent standstill. In all probability work of that nature has been carried on for some time with but very little remuneration, and nothing but a detriment to the property. There is a good mine known to exist there, and all it needs is capital to open it np and develop it, which will undoubtedly be done in the near futnre.

AT THE SOOTH EUREKA.—Amador Co. *Record*, Sept. 15: Everything is running along smoothly at the South Eureka mine. The west wall was encountered at a distance of 312 feet. Work has now ceased in this qnarter and they are drifting north and south on the east wall from the crosscnt. Dr. J. .. Mayon, C. W. Randall and John Taylor were np from San Francisco last week on business connected with the mine. They expressed great satisfaction with the developmeots that have already been made.

El Dorado.

BEAA CREEK. — Cor. Placerville *Democrat*, Sept. 15: There is considerable prospecting going on in this neighborhood. Jackson Bros. are actively engaged in opening two mines in the vicinity of Spanish Flat. The Lewis mine on the east side of Rock creek is showing np well and promises to become one of the prominent properties of the county. Mr. Jas. D. McLane is reported to have made some rich discoveries in the vicioity of Dutch creek. He uses a divining rod, or, more properly speaking, an electric indicator.

Modoc.

AT HAYDEN HILL.—Adin *Argus*, Sept. 15: From parties down from Hayden Hill last Saturday, we learn that the Golden Eagle mine is prospecting better than for years past and better than any of the mines there. A few days ago the owners, Messrs. Highett, Richie and Dillon, struck a vein that assays about $200 to the ton. Dan Ambrose, who has been at work for the Tnnneling Co., says they have their tunnel in 450 feet. Nothing of importance has been found yet, although indications are fine. This tuonel promises to open rich veins. Work was commenced and is progressing on a systematic scale, and if the Hill is rich with the yellow metal this company will find it.

Nevada.

THE CANTENNIAL.—Nevada City *Herald*, Sept. 19: The latest news from the mine is to the effect that the main tunnel is being driven ahead through the back gravel channel. The deposit shows a raise above the tunnel and is of the same general character as at last report, the gravel being coarser and the gold heavier than that fonnd in the front channel. The tunnel is now in 2500 feet, and the problem now is whether to continue driving it ahead or stop and go into practical washing operations, utilizing the very extensive deposit already developed of good pay gravel in the front channel. This can be done advantageously, and the extending of the tunnel reserved for the winter season, when gravel-washing may be obstructed by bad weather and deep snow.

TELEGRAPH MINING CO.—Grass Valley *Telegraph*, Sept. 19: We are glad to note that the Telegraph Mining Co. is now in good ground and with every prospect of big success. The miners working there have been in "hard ground" for a long time and the expenses of the work have been very heavy. The stockholders have shown courage and confidence and have come up with assessments with entire promptness. Now that good ground has been encountered progress will be rapid and any day may give a big find. The Telegraph is a home company and its affairs are well managed by men who understand the mining business.

BUSY.—Grass Valley *Telegraph*, Sept 13: The Rogers quartz mill is very busy. To-morrow it will start to crush ore of the Lafayette mine, and will then have a ruu on ore from Osborn Hill, from the Twitchell and several other s. Ore enough is on hand to keep the mill busy for a month, and the ore is good. The mill is perfect in equipment and full returns are given.

WYOMING CONSOLIDATED. — Grass Valley *Union*, Sept. 13: The Wyoming Consolidated mine of South Grass Valley is looking very well. The incline is now at a depth of 165 feet, and the quartz coming out is making a fine appearance, showing in heavy sulphurets, galena and black jack, with a liberal sprinkling of gold. The vein is from 8 to 18 inches in size, and all of it is carrying mineral as here stated. The prospects are the best yet encountered in the mine and are highly encouraging to the stockholders, who have held fast to their faith that the mine would develop in good shape. Mr. Runnells, the superintendent, brought some of the rock np from the mine yesterday, and it attracted much attention and was favorably commented upon by experienced miners. The quartz can be seen at the cigar store of Parsons & Quick.

San Diego.

JULIAN MINES.—*Sentinel*, Sept. 13: There is no hurrah in mining circles, but all the boys that are working are taking out gold, and doing much better than working for wages. A. P. Fray and Robert Johnson commenced about 11 months ago to open up the Eagle mine in the face of almost insurmountable obstacles; they have said nothing about their work, but have accomplished greater results in that time than any mine in the camp. They have driven a tunnel 800 feet into the mountain. Last week they had their first crushing of ore, and those that stood by the men have found that their confidence was not misplaced. The ore yielded $85 per ton, and they have considerable on the dump and plenty in the mine.

Shasta.

A RICH STRIKE.—Shasta *Democrat*, Sept. 14: Mr. Conner, a successful miner and prospector, a week ago Sunday made one of the richest discoveries, on Salt creek, ever made in Shasta county. The find is on the old Kempton grouod on an adjoining claim to the Cleveland, one of the Tellurinm gronp. He purchased the claim for $100, and theo went to work carefully prospecting. He was rewarded by uncovering a prospect from which he has taken out between $500 and $6000 in sinking about 10 feet. The vein is about three feet wide, has true walls, and prospects immensely for 150 feet along the surface. Pounds of the rock taken out hung together with strings of gold. Mr. Connor has four claims in a group there, all of which show np well.

Tuolumne.

MINEAS KILLED. — On Tnesday, William Symons, Sr., and J. B. Leavitt were killed in the Carlotta mine. They were standing upon a temporary platform built in the shaft for the purpose of making repairs, when the platform gave way, precipitating them to the bottom of the shaft, a distance of about 100 feet, killing them instantly.

NEVADA.

Washoe District.

CONS. CAL. & VIRGINIA.—*Chronicle*, Sept. 17: There has been extracted from all parts of the mine during the week 986 1670-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $24.74 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $20.29 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $14,102.31.

MEXICAN.—On the 1465 level, the west crosscut, which was started from the drift run north from the crosscut run west from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, has been advanced 15 feet; total length, 82 feet, continuing in porphyry and clay.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift has been extended during the week 24 feet; total length west from the joint shaft, 2419 feet. The face is in porphyry, from which there is a strong flow of water.

SIERRA NEVADA.— The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 24 feet; total distance west of shaft, 2419 feet; face in porphyry, from which there is a stroog flow of water.

ANNAS.—During the week east crosscut north on 420 level was advanced 19 feet; total length, 122 feet; formation in face clay and porphyry.

GOULD & CURRY.— All work in the old stopes, on the 200 and 400 levels, has been discontinued. During the week we have extracted 39 cars of ore, car samples $19.31. Shipped to the Occidental mill 32 tons and milled 85 tons; battery assay, $21 28. Discontinued shipping ore on the 11th inst. Resumed work in the joint north drift with Savage Company on the Sutro tunnel level and advanced same 10 feet; total length, 540 feet; face of drift in very hard rock.

BEST & BELCHER. — 900 level: During the week the north drift from east crosscut, No. 1, has been advanced 15 feet; total, 952 feet; face in porphyry, clay and quartz.

HALE & NORCROSS.—1800 level: During the week advanced the north drift 15 feet; total length, 195 feet; face in porphyry. We are also diggiug a drain in this drift. The south drift on this level was extended 10 feet, when work in the face was stopped, as the drift has reached our south line. We have put in place on the 1800 level a No. 9 Knowles pump. Extended the compressed air pipes from the 1500 to the 1800 level, and carried the discharge pipe for the pump from the 1800 to the Sutro tunnel level, and are fully prepared to handle any water we may encounter on this level.

POTOSI.—Extracted and sent to mill the past week, 41 500-2000 tons of ore from the 550, 930, 1100, 1150 and 1800 levels. Worked during the week, 311 tons. On hand at mill, 81 900-2000 tons; average battery assay, $21.79; average car sample assaye, $24.55.

CHOLLAR.—Are repairing north drifts on the 750 and 850 levels. The east crosscut, 160 feet south of north line, 930 level, is in 50 feet; face in soft porphyry.

WAAN SHAFT.— The joint Alpha and Exchequer west crosscut, 1800 level, is out 41 feet; face in quartz and porphyry. The joint Potosi and Bullion northwest drift, 1800 level, is out 844 feet. The face is in hard porphyry.

BOLLION.—The station in the Potosi winze, 1850 level, is completed, and a drift started southwest to connect with the northwest drift from the Ward shaft. The drift is now in 42 feet from the footwall; face in low-grade quartz. The northwest drift from the 1800 station, Ward shaft, is out 844 feet; face in porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels have extracted and milled 172 tons of ore of the assay value of $19.85 per ton as per battery samples.

Tuscarora District.

NAVAJO.—*Times Review*, Sept. 16: The stopes are looking better this week, yielding three cars of ore estimated at $367 per ton, and eight cars at $45 per ton.

BALLA ISLA.—No 1 upraise, 250-foot level, extended six feet; the vein is looking better and the ore of higher grade. North drift on vein from the raise extended eight feet.

NOATH BELLE ISLE.—North drift, south 300-foot level, extended five feet; ore continues high grade and the vein is getting wider. Stopes below the 400-foot level are not looking so well.

NEVADA QUEEN.—Stopes at chutes 6 and 7 are about exhausted. Stopes below the level continue about the same as last report. Exposed in east line drift one foot of second-grade ore. Hoisted 33 cars first-class ore, sample $322 per ton, and 160 cars second-class, sample $24 per ton.

COMMONWEALTH.—Stopes from east line drift not so high grade. East drift from No. 3 chute extended 20 feet without improvement. Third-level stopes producing usual amount of second-class ore. Hoisted 16 cars first-class ore, sample $270 per ton, and 138 cars second-class, sample $24 per ton.

Hawthorne District.

AT WORK.—Hawthorne *Bulletin*, Sept. 15: Pat Shannon has a force of men at work on the Morning Star in Hawthorne District. It is reported that the lessees of the Pamlico mine have cut into a Body of high-grade ore in that mine. A force of men is at work setting the poles and stringing the wires for the new telephone line between Hawthorne and Bodie. The arrastre made its first cleanup last week, after running through 25 tons of ore. The result is said to have been satisfactory. There is ore enough waiting for the arrastre to keep it running steadily for several months.

ARIZONA.

FROM VARIOUS CAMPS. — Mohave *Miner*, Sept. 15: Ten tons of ore from the Queen Bee mine, near Mineral Park, are expected at the sampler next Sunday or Monday. Several rich strikes have been made in the mountain on the west side of Detrital valley, this county. The ore is rich in horn silver and oxides rich in the white metal. Beebe's big team took out the last load of machinery for the Chloride smelter yesterday morning. We are reliably informed that the smelter will commence operations about the first of the month. One of Beebe's big teams is engaged in hauling 200 tons of Gold Bug ore from the mine to Monaghan & Murphy's mill on the river, from which point the ore will be shipped to the Needles on barges. The Flores mill is ponnding away on high grade gold ore and turning out large quantities of bullion and conceotrates. There are fully 600 tons of rich free-gold ore on the dumps of the mines in the vicinity of the mill that will be worked before a cleanup is made. On the Irondale mine, 100 yards north of the Chief of the Hills, in Indian Secret district, owned by Messrs. Eaton, Cowan, Taggart and Woods, a six-inch streak of ore has been encountered, which will run from 500 to 1500 ounces of silver to the ton, and the owners feel exceedingly jubilant over the find. Robt. J. Grant, manager of the Gold Bug mine, has been spending the week in Kingman. He informs us that the new shaft being sunk on that property is now down about 85 feet, and in good ore all the way. The mine is employing 12 men, and the company is putting the property in tiptop shape for the extraction of large quantities of high-grade ore this winter. The Prince Albert mine in white Hills, owned by Robt. Patterson, is showing np finely, and 14 leases have been given to different parties. On the leass worked by Jackson & Co., several sacks were recently extracted, and, after cutting down the pile of ore, a sample was obtained which ran $5821, figuring silver as worth 83 cents, or 8556 ounces per ton. Every one who has been fortunate in securiug a lease on this valuable property is takiug out an immense amouut of this kind of ore, and in every instance making money hand over fist.

RICH FIND.—Globe *Silver Belt*, Sept. 17: A remarkably rich find of silver float was made at Richmond Basin a few days since by J. C. Glisson and Lanzbury on one of Leroy Ikenbury's claims. The discovery was made by the men while chopping wood, and at last accounts about 100 pounds in nuggets had been found, several of which weigh five or six pounds. They were all found a few inches below the surface, and Messrs. Ikenbnry, Glisson and Lanzburg are now eagerly searching for the ledge from which the nuggets came. Their estimated valne in eilver is seven to eight dollars a pound. They are by far the handsomest silver specimens we have ever seen. Considerable rich float has been found in the Basin from time to time, and the mines there have produced a large amouut of silver, notably the Mack Morris mine, the output of which was nearly $700,000. Bnt the belief prevails that untold wealth remains to be nearthed in the Basin or the overtowering Apache peaks.

LOCKY CUES.—Tombstone *Prospector*, Sept. 11: Five years ago yesterday morning at 7 o'clock, ground was broken for the new working shaft on this mine, which up to the present has been a fine producer and bids fair to keep up its record. The output from that time to the 1st of Jnly, 1892, has been 19,693 tons, containing 476 293 ounces of silver and 5972 ounces of gold. The ledge of this mine is a giant in strength the full length of the claim, as demonstrated by the development on the several levels; but most of the ore is too low in valuation to pay with the prices that have prevailed and are now ruling. A marked exception has been in two immense cbntes of ore that have yielded handsome returns.

TOUGHNUT AND NORTHWEST.—Nothing new in these, but usual output of ore, if we except development on surface near the Northwest hoist on a very promising outcrop of ore that has beeo walked over for many a day.

GIAAAN AND SULPHURET.—On the third level of the Sulphnret, prospect work is still going on through a winze, operated by an underground hoist. On the Girard the new steam pump, received a few days since, is being placed on the fourth level (350 feet deep), and the ledge will be further prospected by an incline winze.

NOTAS.—Over 800 tons per month are being shipped by this company. It takes 15 engines in constant employment to do the work—four surface hoists, three nnderground hoists, two air compressors, three rock-breakers run by independsnt engines, one at the machine-shop and in the Lucky Cnss, one on diamond drill, and one on pnmp.

MONTANA.

THE PAAAOT.—Butte *Inter-Mountain*, Sept. 17: At the 800-foot level of the Parrot mine the etation is bsing cut at present and in a week or so exploration work will be in active progress. Few mines in this district have such a record for steady production as has the Parrot. Month after month the polished discs of its mammoth engine revolve, carrying up from its depths hundreds of tons of the very richest copper-silver ore. Few mines are as well equipped for the extraction of ore and none can take precedeuce in the way of neatness of surroundings or conveniences afforded its employes. Friday afternoon the *Inter-Mountain* man was afforded an opportunity of exploiog its lower levels. With Superintendent Tibbey as a guide a descent was made to the 600-foot level. This station is said to be the largest in Montana and the air of cleanliness which pervades it could be imitated in other mines to great advantage. All the walls are whitewashed. The signals of the mine are posted conspicuously on both sides of the station. A duplex Knowles pnmp, capable of forcing a large volume of water 1000 feet high is at work in the east end of the etation throwing 4200 gallons of water to the surface every honr. As the drift is entered, a current of air sufficient to extinguish candles is felt, and this strong draft being something nnheard of at this depth an explanation was demanded. It seems Mr. Tibbey eojoys the distinction of having a "hobby" and that "hobby" is on the matter of mine ventilation. He has succeeded in demonstrating that mines can be rendered cool and furnished with pure air without the aid of an artificial draft, and, as he believes that pnre air is as essential as food to a miner, he has perfected a process of ventilation by natural means for the Parrot mine, which has earned for him the gratitude of his employes. We push into the drift and etop for a moment to gaze on a slimy accumnlation of a beautiful green color which has formed on the sides of the drift. It is the exudation of the mineral body which has been carried down from the ledge by the water. Farther on, the sides of the drift are covered by beantiful green crystals. Eleven hundred feet from the station, through a drift with a plank floor as level and smooth as a billiard table, the breast or face of the drift is encountered where a number of miners are at work. Here the magnitude of the great 35-foot ledge of copper-silver ore is shown.

BONNER.—Messrs. Coulter, McRae & Williams have leased and bonded the White Monntain mine in Brown's Gulch and will begin operatione on the property at once. The White Mountain adjoins the Sailor's Dream, a good paying gold property owned by Kendrick & Co. of this city. It is said that Finnegan and Rising have again made a lucky strike on the Florida. A ledge of silver ore was nocovered a few days ago which assayed 2000 ounces to the ton. The new 10-stamp mill erected by Dave McCranor, at McCranorville, is running full

blast and is in charge of Mr. Rihell. A tramway 317 feet long is built down the side of the mountain, and it is expected that by October 1 it will be in running order. The Silent Treasure Co. has its mill almost completed. A test quantity of rock was put through the stamps during the week and worked satisfactorily. The company is considering a proposition to put in a dynamo. There is abundant available water power to generate an electric current at a trifling cost for maintenance. Sheriff Lloyd has some good news from his Golden Chief mine this week. Some time ago he let a contract to sink the shaft 100 feet. During the week crosscutting began, and the sheriff says a 28-foot ledge has been encountered. He says the ore runs from 18 to 200 ounces silver and four per cent copper. This property lies on the flat east of Meaderville.

NEW MEXICO.

PLACERS.—*Southwest Sentinel*, Sept. 13.—Work has been commenced in the placer mines near Hillsborough, but only a small force of men will be employed for the present. The placers in that district have been worked to a greater or less extent for the past 20 years, but the scarcity of water has prevented extensive operations. The placers around Hillsborough are richer and more extensive than those of any other district in the Territory except the placers near Golden, in Santa Fe county. Manager Waring says that there is no immediate prospect that the Flagler Works here will be started up. The low price of silver makes it impossible to treat low-grade ores at a profit, and there is no reason to hope that the works will be started this year. With silver at even a dollar an ounce, the works could be kept running to their full capacity, which is about 100 tons of ore a day. The Gold Hill custom mill is running on ore from the Patterson mine. This mine is believed to be one of the best in the district, and was showing up well at the time of the death of the owner, when development work was suspended. The Standard mill, at Gold Hill, is running steadily on ore from the company's mines. The Standard Company is the largest gold producer in the district. P. B. Smith is still running his lixiviation works on low-grade ore from the Volcano mine at Stein's Pass. There is still a large quantity of ore on the dump to be treated. Another strike has been made in the Cook's Peak district, and there is now fully $100,000 worth of ore in sight in the mine. This camp is the largest producer of lead carbonates in New Mexico, and its development has only been fairly commenced.

OREGON.

PAY DIRT EVERYWHERE.—Grant's Pass *Courier*, Sept. 15: J. S. Plaster had his prospecting pan at work down on Rogue river, near its junction with the Applegate, last week, and found dirt which pays 25 cents to the pan. A five-mile ditch had been surveyed from the Applegate 16 years ago, to work these placers, but was not completed.

ANOTHER PLACER.—H. C. Smith last week struck a placer mine on the bank of Rogue river about two miles above town. An ordinary man can clean up $2.50 in a day of ten hours, and Mr. Smith thinks there is no need of a healthy man going hungry or getting broke in this country.

GOING DOWN ON THE EXCHEQUER. — W. G. Whorf, the mining man from Amador county, Cal., has bonded the Exchequer mine and will proceed at once to sink a shaft three or four hundred feet deep on it for the purpose of determining the lasting qualities of the ledge. Five or six men will be put to work, aided by the most improved drilling machinery, and Mr. W. thinks twelve months will elapse before any definite results can be obtained. Dr. Flanagan had already opened up the ledge for 75 feet or more and the ore gives indications of holding out at its present richness.

THE VIRTUE.—Baker City *Democrat*, Sept. 12: Dr. J. M. Meseroll, manager and treasurer of the Virtue Mining, Milling and Development Company, will arrive in this city to-morrow from Stockton, California. It is understood that a reorganization of the company has taken place, the bond on the Virtue mine from the owner, Geo. W. Grayson, of San Francisco, extended one year from next December, and that all things are in readiness for immediate resumption of operations. A new pump and other machinery has been purchased and is now on the way to this city. A new pump in place in the mine, the water now in the tunnels and shafts will soon be disposed of and the mine will be in a condition to give a large output of ore for reduction in the mill, which is in complete order for the turning on of steam.

CRACKER CREEK MINES.—Mr. Joseph Mikel arrived on the S. V. R. R. yesterday from Cracker City and reports good times in that mining district. The E. & E. mines and the Powder River Milling Company are employing a large pay roll and operations are being conducted on a large scale. The mill site of the North Pole Company has been graded, lumber is on the ground for the mill buildings and the shipment of 300,000 pounds of mill machinery purchased by the company in the East is now en route and is expected to arrive in Cracker City in a few days. The building of this large mill plant will cause a large employment of labor in addition to the 200 men already at work in the camp. In the country and mining districts tributary to Cracker Creek an advanced movement has taken on and there is great activity manifest.

UTAH.

THE EDA.—Bingham *Bulletin*, Sept. 17: The incline shaft on the Eda lode, located at the head of Cottonwood gulch, is now down about 300 feet and the vein being followed looks more encouraging than ever. About two and a half feet of good milling ore was encountered in the face of the incline last Saturday, and the operators feel very much elated over it, believing that it will develop into a fine body of first-class ore in a short time.

TO SHUT DOWN.—Tintic *Miner*, Sept. 17: Tommy Croxall, owner of the South Swansea, reports that he will ship one more carload of ore and then shut down the mine until the silver market improves. A marvelously rich gold strike is reported to have been made in the Mammoth on the 1000-foot level on Monday.

CRESCENT.—Park *Record*, Sept. 17: The tramway made its last trip on Thursday afternoon and has been practically closed down for the year. The concentrator will follow suit as soon as the present lot of ore upon which the mill is engaged is cleaned up. The reason given at the headquarters for the shut-down is that the company does not care to market its ore with silver at present quotations, preferring to store it at the mine, and feels that it will undoubtedly prove a wise move. About 50 men will be retained at the mine, who will be kept busy breaking down ore and in prospecting and uncovering new ore bodies and opening up more stoping ground. John Bogan is pushing matters at a lively rate on his Cumberland group. He has ordered a new Common-Sense whim which he expects to arrive this week, together with 400 feet of ⅝ wire cable. The work of jigging the second-class ore at the May Flower mine has grown into quite an industry and a monster dump is being built up. Four jigs are kept busy all the time. Up to date there is no sign of even a preparation to resume work on the Comstock, the favorable reports to the contrary notwithstanding. The only way to resume is to resume, for work speaks louder than words. Talk about a solid piece of machinery something with weight to it, and the big Cornish pump at Ontario No. 3 is decidedly in it. The walking beam that broke on the 4th of this month, when loaded on the cars ready for transportation to San Francisco weighed 140,250 pounds, or over seven tons. The beam will be repaired and a new one made so that in case of another break an extra one will be on hand. The contract has been let for the 500-foot tunnel to be run this fall and coming winter on the Dolberg group of claims, lying west of the Meears group. LeCompte, Rosscamp & Glenn got everything in shape Wednesday last and gave their concentrator a trial run. It moved smoothly enough, but the large water wheel did not develop power enough to drive the machinery as fast as desired, hence the engine they have in reserve will be put on. The ore concentrates very nicely and looks as if it should net the owners a fair profit.

ORE AND BULLION.—The Ontario mill shipped 41 bars of bullion this week containing 21,368.81 fine ounces of silver. The Marsac mill will ship to-morrow 10 bars of bullion, containing about 14,000 ounces of fine silver. Following are the ore shipments from the Mackintosh sampler for the week: Ontario, 645,840 pounds Anchor concentrates, 526,350; May Flower, 356,820; Silver King, 74.740; Daly, 210,060; May Flower concentrates, 44,000 pounds; total, 2,057,810 pounds.

WASHINGTON.

A SILVER MILL.—Okanogan *Outlook*, Sept. 13: The 60-ton concentrating plant of the Washington Reduction Company has commenced operations, and, as a matter of course, all who are in any way interested in the development of the mining industry, and especially those interested in the silver and lead mines of this section of the great Okanogan mineral belt, are most anxiously awaiting the results. The foundation for the great importance attached to this enterprise lies in the fact that it involves to a great extent the immediate prosperity of the entire mineral belt tributary to it, including the Ruby, Conconully, Lime Belt and Chloride districts. There can be no doubt that this mill is calculated to work successfully a considerable quantity of our ores, but not all of them, and owners of mines and mining claims will now have an opportunity to apply the test as to whether their ore is a concentrating ore and whether it will stand the cost of milling and shipping in that form. Should it prove that a large per cent of the silver-lead ores of this section can be worked successfully and at a profit by this process, it is impossible to overestimate the advantages that would acrue therefrom. It would make possible the development of a large number of claims by affording a market for the product and a source of revenue for the owners, the absence of which has heretofore been considered the greatest obstacle to the advancement and prosperity of the camp. The Washington Reduction Company is composed of Portland and San Francisco people and is officered as follows: President, D. P. Thompson; vice-president, Fred Holman; secretary, Jonathan Bourne. The directors and principal stockholders are Bays & Jeffreys, Preston Smith, W. K. Smith, Woodward & Son, Mr. Shepherd, C. P. Knowles and L. Wagoner. The company has a paid-up capital stock of $100,000. The mill is at present running on the ores of the First Thought and Arlington, which companies have contracted to furnish ore at the rate of 20 and 10 tons respectively per day for a term of three years. One-half of its capacity, which is 60 tons per day, is to be reserved for custom work. Mr. Wagoner has under his charge in the mill and mines a force of about 60 men.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

Market Reports.

Local Markets.

SAN FRANCISCO, Sept. 22, 1892.

The local money market appears to be working closer, for warehouse men report firmer rates of interest on grain. The closeness of the market does not appear to be due so much to a lack of available funds as to banks wishing to be prepared for an emergency provided one comes. The active movement in mining shares is an unexpected, factor in some quarters, in the local money market, and its influence is closely watched. Heretofore a deal in mining shares went hand in hand with a more active demand for funds, which gave employment to large sums of money. For some time past brokers have not been able to employ any money, and in consequence the demand for funds from them has been *nil*. Remittances from the interior are coming in more freely. Some report that remittances from the country exceed the demand from that source.

New York mail advices to Sept. 17th report that cheap money markets in Europe and fair rates of interest in the United States are steadily weakening the foreign exchange market and pulling down quotations. On the 17th there was a renewed disposition on the part of bankers to sell bills for the purpose of employing foreign capital at New York. Bankers were also lending their bills against stock collateral, and the supply made in this way was assisting the downward tendency of rates. Commercial bills were not plentiful at last advices, but still there was some increase in the volume offering. Importers and remitters generally were not buying freely.

The New York *Iron Age*, Sept. 15, says: "The bank statement showed a decrease of $4,726,400 in cash and of $2,257,375 in surplus reserve, leaving this item at $7,630,000. The banks now hold only one-half of the surplus reserve of a year ago, the losses in five weeks past having been approximately $20,000,000. Loans were contracted to nearly $5,000,000. The discount rate in London is three-fourths per cent, and in Paris seven-eighths per cent, the lowest ever known there. In the West the demand is unusually active at the banks, grain receivers and provision packers being the principal borrowers, but requirements are expected to be much less than when there were larger crops to be moved and the pressure for shipment more urgent."

For the week under review general trade was fairly active with the volume of goods sent out, showing a decided increase over the preceding week. Although there appears to be an increase in general trade, yet the buying does not indicate that interior merchants will carry large stocks this winter. For our surplus fruit, fresh dried and canned, there continues to be a good demand from the distributing points at the East. Europe, it is contended by many, has been buying more freely of both dried and canned fruits.

With foundrymen and ironworkers, in general, business continues fairly active, although some report times very dull. The low prices ruling for raw materials are largely in favor of our manufacturers, but strong competition compels them to make close figures, particularly on large cash orders. The breaking up of the International Transportation Association is a source of some uneasiness and a general desire to learn what will be the next move. It now looks as if the railroad magnates in this country have been compelled to buy large quantities of their securities, which, if correct, will lead them to organize and work in such a way as to make money out of the investment, advance the price of the securities and sell out at good round profits, This, of course, will take time to bring about.

SILVER—The market continues to bang suspiciously steady. Heretofore, such steadiness has been followed by a rapid decline, but in this instance it is hard to forecast the future. According to all general rules of trade and commerce, the market value of silver ought to advance. From the best information obtainable, the conclusion is irresistibly drawn that the output of the mines does not equal the consumption. If this is correct, it will be only a question of time when the surplus of the silver mining counties will go into consumption. At present, the inactive money markets abroad and low rates of interest are against the metal. There was exported the past week $127,000 in bullion to China, and $166,000 in bullion to Japan.

MEXICAN DOLLARS—The market was fairly steady at around 67½ cents. There was exported the past week $187,175 to China, and $313,000 to Japan.

BORAX—Receipts the past week aggregate 220 ctls. There has been a good demand owing to the cholera scare. The consumption at the East in this direction is said to be very large.

QUICKSILVER—Receipts the past week aggregate 331 flasks, and the exports by sea as follows: To Auckland, 10 flasks; to Mexico, 27 flasks; total, 37 flasks. The demand is only fair. The market is barely steady.

ANTIMONY—The market does not exhibit any features worthy of notice. New York mail advices report that market quiet, at the following quotations: 10¾c@ 10½c for Hallet's, 11¼c for LX, and 12c @ 12¼c for Cookson's in round lots.

PIG LEAD—The market has been quiet. The September boom, which had been confidently looked for at the East, did not materialize, although four sales were reported at last mail advices. Consumers are cautious.

TIN—The market for both pig and plate has been quiet, with prices in buyers' favor. The season for the heaviest demand has passed. Eastern mail advices report an inactive market, with prices barely maintained. There was, at last advices, no speculative demand or any movement looking in that direction. London cables report a fair shipment of plate to this country.

PIG IRON—Liberal supplies on the way, low prices at the East and low freights by sail are against sellers and create an uncertain feeling with buyers, who do not appear to be buying beyond near-by wants, unless offered concessions. *Iron Age* reports the Eastern markets as follows: "The most encouraging development of the week is the certainty that the demand for pig iron is such that it is making inroads upon the stocks, and that simultaneously current production is even lower than it was at the beginning of August. The active capacity on September 11 represented a weekly make of 151,648 gross tons, against 155,136 gross tons on August 1. Our reports of stocks show a decline from 1,000,505 tons on August 1 to 937,882 tons on September 1, a falling off 62,623 tons. Philadelphia and Chicago report the pig iron market to be getting into better shape, while Cincinnati, the principal center for the distribution of Southern iron, reports a dull market. The Pittsburgh market is still struggling with its burden of Bessemer pig and is a little weaker."

COPPER—The market is weak and rather unsettled. London cables report that market unsettled by bearish operations of Paris traders. Late New York mail advices report that the supply exceeds the demand. The talk of increased production of Electrolytic copper having an unfavorable bearing on the market for the Lake product, and, doubtless, the competition of that class of metal exerted a certain amount of influence, since the product is as good as Lake copper for many uses and considerably cheaper. At last advices 11¾c was a common quotation for ordinary parcels, while sales were made at as low as 11¼c. For that matter, the last named price would appear to fairly reflect market value for wholesale quantities. Electrolytic was obtainable at 10¾c, possibly at a lower price, and on common casting copper anything above 10¾c for carload lots was the exception. The Bureau of Statistics reports the exports for the seven months ending with July as follows: Ore and matte in 1892, 331,245 tons; in 1891, 271,191 tons; ingot in 1892, 15,094,149 lbs. and in 1891, 39,724,311 lbs.

COAL—Imports the past week aggregate as follows: Sydney, 1913 tons; Newcastle, N. S. W., 18,294; Departure Bay, 1340; Coos Bay, 450; Nanaimo, 4006. Total, 26,005 tons. The market continues disappointing to the selling interest. There does not appear to be any snap or life to the demand, and to induce liberal buying, concessions were in order. Either consumers have liberal supplies or else there is a large falling off in consumption. The more general use of electric lights and electricity for motor power are largely against coal.

Mining Share Market.

SAN FRANCISCO, Sept. 22, 1892.

During the past week under review, the market has been quite active, with lively and attractive fluctuations in the Comstock shares. As the market gained in strength, with advances established, the outside public became more interested. The first decided buying by outsiders was noted on Monday, but the large majority of those who bought sold when a reasonable profit was in sight, only to buy back when the market shaded off. This trading, combined with the chippers' trading and rapid cross-orders by insiders, made the transactions partake more of old times, and brought joy to the heart of brokers and money to their depleted exchequers. As yet, chronic traders are rather suspicious and only buy for turns; yet there can be no question but they will gradually gain in confidence and buy more freely, hold longer, and, at the same time, bring friends into the arena. To educate the public to this point, the rings must continue to make an active market at higher prices, but when the former are inveigled into the business, they will be left with shares on which to pay assessments. With shares again well sold out, the days of large assessments will return. It is all nonsense to say the rings cannot induce the public to buy shares, for gambling appears to be inherited, and, with such a seemingly easy way of making money as appears to be offered by dealing in mining shares, it is an impossibility for it to be resisted. There are very few that sell out at a good profit, who can resist the temptation to buy back when prices go higher. In the excitement of a deal and an overweening desire to make money very fast, outsiders invariably come out in the end financially stranded. Six years' experience of writing on the mining share market has taught the writer that mining shares are, after a person has sold out and prices go higher, very much like the old woman's swine; if let alone, they will come home dragging their tails (assessments) behind them. The present move in the share market will not prove an exception, for it makes no difference how high the market will be forced, it will come back to low figures again with lines of assessments added. This will continue so long as the game is bullion for insiders and assessments for outsiders.

The market opened this morning weak and inactive, with only Belcher holding up. It looks as if Bob Morrow is standing under Belcher so as to keep the market from going to pieces. The support given to Belcher looks very much as if the rings have given instruction to prosecute certain work in the mine so as to make a much better showing than has, as yet, been made public. With a new and more important strike Mr. Morrow will undoubtedly, through cross orders, advance prices quite rapidly, by which means he will be able to carry out the reported instructions of D. O. Mills to load up the public with shares in any and every mine on the Comstock. It is a great game, this, of working the Comstock mines.

The official report of the ore worked and bullion produced for account of the Potosi mine at the Nevada mill for the month of August shows the ore was worked up to the unusually high percentage of 94 per cent. This is the same mill which returned such a low percentage on the ore milled for the Hale & Norcross Co. under the old management. Evidently the suit against the late directors of the latter company is bearing good fruit.

John W. Mackay is in Europe, Senator Jones is away, Alvinza Hayward is busy attending to the Hale & Norcross suit and also railroad matters, Francis G. Newlands is making his political canvass

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND	SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2,	Oc. 6,	Oct 27	C E Elliott, 3 9 Montgomery
Belle Isle M Co, Nevada	15	1c	Aug 22,	Sept 26,	Oct 20	J W Pew, 310 Pine
Best & Belcher M Co, Nevada	52	25c	Aug 17,	Sept 22,	Oct 13	L Osborn 309 Montgomery
Bullion M Co, Nevada	3	25c	Aug 11,	Sept 15,	Oct 4	R R Grayson, 331 Pine
Challenge Cons M Co, Nevada	12	10c	Aug 24,	Sept 27,	Oct 18	O L McCoy 331 Pine
Commonwealth Cons M Co, Nevada	9	10c	Sept 7,	Oct 13,	Nov 9	R R Grayson, 33C Pine
Confidence M Co, Nevada	21	50c	Aug 13,	Sept 15,	Oct 6	A S Groth 414 California
Crocker M Co, Arizona	12	5c	Aug 11,	Sept 20,	Oct 18	A Waterman, 3 9 Montgomery
Crossbow M Co, California	1	1c	Aug 4,	Sept 12,	Oct 3	H D Walker, 3 9 Montgomery
Crown Point M Co, Nevada	58	25c	Sept 15,	Oct 20	Nov 10	J Newlands, 331 Pine
Del Monte M Co, Nevada	6	10c	July 26,	Sept 5,	Oct 5	J W Pew, 310 Pine
Derbec Blue Gravel Co, California	10	1c	Sept 11,	Oct 17,	Nov 7	T Wetzel 320 Sansome
Eureka C us Drift M Co, California	5	5c	Sept 19,	Oct 24,	N v 11	D M Kenr, 330 Pine
Evening Star M Co, California	5	1c	Aug 19,	Sept 21,	Oct 8	J J Scorille 320 Sansome
Florida Hill M Co, Idaho	4	3c	July 29,	Sept 2,	Sept 28	R R Grayson 331 Pine
Golden Fleece Gravel M Co, California	17		July 18,	Aug 21,	Sept 30	W J Gleason, Phelan Block
Gover M Co, California	3	1c	July 28,	Sept 1,	Sept 28	R McF Dobbs, 15 Fremont
Guatemala & California M Co, Honduras	7	81.5	Aug 9,	Sept 15,	Oct 8	E Oliver, 22 Mint Avenue
Hale & Norcross M Co, Nevada	102	50c	Aug 11,	Sept 15,	Oct 7	A B Thompson, 3 9 Montgomery
Independence M Co, Nevada	17	5c	Aug 15,	Sept 19,	Oct 13	J W Pew, 3 0 Pine
Inyo Marble Co, California	18	50c	Sept 2,	Oct 22,	Dec 1	A F Thane, 137 Montgomery
Jack Rabbit M Co, Nevada	5	5c	Sept 17,	Oct 19,	Nov 8	T Wetzel, 320 Sansome
Keystone Con M Co, California	3	81	Aug 22,	Sept 26,	Oct 18	J H Isham, 310 Pine
Mono M Co, California	32	25c	Sept 15,	Oct 24,	Nov 14	H D Walker, 3 9 Montgomery
Mountain Tunnel M Co, California	5	7c	July 28,	Aug 27,	Sept 26	E C Lander, 219 Sansome
Navajo M Co, Nevada	22	10c	Aug 17,	Sept 21,	Oct 14	J W Pew, 310 Pine
North Belle Isle M Co, Nevada	20	10c	Sept 1,	Oct 6,	Nov 7	J W Pew, 310 Pine
Northwestern G M Co, British Columbia	5	25c	Aug 17,	Sept 25,	Oct 15	F Bometzn, 428 California
Peer M Co, Arizona	13	10c	July 19	Sept 8,	Oct 6	A Waterman, 3 9 Montgomery
Silver Hill M Co, Nevada	31	5c	Aug 2,	Sept 6,	Sept 27	D O Bates, 309 Montgomery
Silver King M Co, Arizona	9	25c	Aug 26,	Oct 7,	Nov 4	J W Pew, 3 0 Pine
Teresa M Co, Mexico	8	10c	Aug 19,	Sept 22,	Oct 8	K J Willats, 809 Market
Yellow Jacket M Co, Nevada	82	25c	Sept 5,	Oct 7,	Nov 11	W H Blauvelt, 331 Pine

MEETINGS

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Eureka Mining & Smelting Co, Nevada	Annual	A F Main, 615 Sansome	Sept 29
Golden Fleece Gravel M Co, California	Annual	W T Gleason, Phelan Building	Sept 30
Middle Creek M Co, California	Annual	H D Hawks, 318 Pine	Oct 6

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Con Cal & Virginia M Co, Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co, California	1 00	A H Clough, 230 Montgomery	Sept 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 20

in Nevada, ex-U. S. Senator James G. Fair is busy with his many money-making schemes, and James L. Flood, with his satellites, is away and yet the share market is active and bigber. This is accepted as confirming the report that D. O. Mills, while here, gave instructions to Bob Morrow what to do. Mr. Mills is putting up a very fine building in this city, besides, he is engaged in enterprises which require money, and a mining-share deal offers the best opportunity to get funds easily.

News from the Comstock mines report that so far the ore body developed in Belcher is more or less broken and therefore disappointing, but that work is under way from which much better results are confidently expected. In Sierra Nevada the ore, like that in Belcher, is more or less broken and disappoints all except members of the rings. It is said that the west drift lower down will probably strike a more compact body of ore, but how long a time it will take before striking the downward continuation of the ore remains a profound secret. On the 1750-foot level in Con. Virginia it is reported they struck $75 ore the past week. In both Hale & Norcross and Savage important work is under way. In several of the Gold Hill mines the work is of quite an important character, but whether the results will be made public depends largely on the success the rings have in peddling out shares. On the 1800-foot Ward shaft they are developing rich ore, but it is doubtful if outsiders will get any of the bullion when the powers that be are ready to extract and mill it.

Soon after the regular Call this morning, Belcher developed considerable strength, and, under manipulation, the price was sent to $3.65, which carried the rest of the market up. The price receded slightly but recovered, and at the noon hour $3.65 was bid. It has been so long between deals that the public appears mystified at the quick moves

At the afternoon call to-day the shares in Belcher and surrounding mines were strong and slightly higher. After the regular call Belcher was advanced to $4 05. Crown Point to $1.60 and Overman to 95c. This is an advance of from 300 to over 400 per cent on the prices one month ago. It looks at the close as if they had made the expected strike in Belcher.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 31.		WEEK ENDING Sept 7.		WEEK ENDING Sept. 14.		WEEK ENDING Sept 21.	
Alpha	.15	....	.15	....	.15	....	.25	.35
Alta	.23	.25	.25	....	.23	.25	.25	.55
Andes	.30	.40	.35	.40	.35	.40	.45	.70
Belcher	.93	1 45	1.00	1.20	1.15	1.80	1.70	3.20
Belle Isle	.10	....	....	....	....	....	....	....
Best & Belcher	1.10	1.40	1.20	1.40	1.25	1.4	1.30	2 75
Bullion	.15	....	.10	.25	.10	*.50	.45	.85
Bodie Con	.30	....	.30	.60	.35	.4	.40	.45
Bulwer	.25	....	....	....	.30	.35	.35	.35
Commonwealth	.05	....	....	....	.05	....	....	....
Con. Va. & Cal	3 15	3.4	3.20	3 35	3.15	3.35	3.10	4.20
Challenge	....	.35	.25	.30	.35	.4	.35	.55
Chollar	.40	.60	.50	.60	.55	.65	.60	1 15
Confidence	.93	1.35	1.10	1.20	1.05	*1.6v	2.25	3.25
Con. Imperial	.05	....	.05	....	....	....	.05	....
Caledonia	.15	.25	.20	....	.20	....	.20	.35
Crown Point	.45	.80	.50	.65	.55	.70	.65	1 30
Crocker	.05	....	....	....	.05	....	.10	....
Del Monte	....	....	.05	....	....	....	.10	....
Eureka Con	....	....	....	....	....	....	2.00	....
Exchequer	.05	*15	.05	....	.20	....	.20	.35
Grand Prize	....	....	....	....	.05	....	....	....
Gould & Curry	.65	.95	.85	1.05	.90	1.0*	.95	1.50
Hale & Norcross	.65	1.25	.85	1.00	.90	*1.40	1.50	2.65
Julia	....	....	.05	....	....	....	.10	....
Justice	.05	.20	.15	....	.15	....	.20	.35
Keutuck	.15	....	.10	.15	....	....	.16	.30
Lady Wash	....	....	....	....	....	....	.10	....
Mono	.15	....	.10	.15	.15	....	.10	.15
Mexican	1.05	1.40	1.20	1.35	1.30	1.45	1.30	2.15
Navajo	....	....	....	....	.05	....	....	....
North Belle Isle	.05	....	....	....	....	....	....	....
Nev. Queen	.05	....	....	....	.10	....	....	....
Occidental	.30	.40	.30	....	.30	....	.30	.50
Ophir	2.05	2 45	2.20	2.35	2.30	2.45	2.30	3.20
Overman	.30	.45	.35	.40	.35	.45	.45	.95
Potosi	.40	.65	.55	.60	.60	.7	.65	1.15
Peerless	....	....	....	....	....	....	.10	....
Peer	.10	....	....	....	....	....	....	....
Savage	.60	.90	.70	.85	.75	.90	.85	1.65
S. B. & M	.23	.3	.25	....	.25	.30	.25	.75
Sierra Nevada	.90	1.60	1.35	1.65	1.65	2.10	1.75	2.60
Silver Hill	.05	....	.05	....	....	....	.10	.20
Scorpion	....	....	....	....	....	....	....	....
Union Con	.35	1.35	1.00	1.35	1.25	1.45	1.35	1.95
Utah	.25	.30	.25	....	.30	.35	.35	.45
Yellow Jacket	.45	.76	.60	.65	.60	.70	.60	1.15

*Assessment added.

IT may surprise many people to learn that there are in the United Kingdom nearly 4000 miles of inland navigation, upon which, on an average, 36,000,000 tons of goods are carried in the course of a year.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 13, 1892.

482,614.—CAR COUPLING—J. N. Braun, Joslyn, Wash.

482,674.—LUBRICATING CUP—I. J. Briggs, S. F.

482,689. — TRANSPORTATION SYSTEM — L. F. Cook, Tacoma, Wash.

482,622.—DRAFT DEVICE FOR WHIFFLETREES—Q. V. P Day, Dinnha, Cal.

482,623. — STRENGTH-TESTING DEVICE—P. J. Dooling, Folsom, Cal.

482,342.— CUT-OFF CASK-FILLING FAUCET—J. H. Driller, Los Angeles, Cal.

482,342.—FOOT LEVER FOR MOWERS—L. L. Folsom, Stone House, Nev.

482,573.— MOVABLE STEP—F. Forster, Etiwanda, Cal.

482,484.— MACHINE FOR MAKING CHANNEL STRIPS—J. G. Lettelier, Los Angeles, Cal.

482,643.—VESSEL-CARRYING DEVICE—J. Mailliard, San Geronimo, Cal.

482,379—FIRE ALARM—J. C. F. McGriff, Los Angeles, Cal.

482,655.— TRANSMISSION OF WATER—M. P. Schelzel, S. F.

482 512.—STRINGING PIANOS—C. S. Weher, San Jose, Cal.

The following brief list by telegraph, for Sept. 13, will appear more complete on receipt of mail advices:

California—Mark Anthony, Berkeley, and W. C. Savage, Oakland, hung; Peter A. Boucbet, Merced, mechanical movement; Edward C. Binet. Clipper Mills, strap for hunching lumber; John T. Cocbran, Oakland, bituminous rock reducing machine; John Q. Finch, San Francisco, axle lubricator; Charles H. Randell and E. S. Pinney, Tulare City, calendar; Nicholas L. Rigby, Los Angeles, lawn sprinkler; Horace H. Taylor, San Francisco, ore separator; James Wilson, San Francisco, window frame and sash; Oregon—Martin Van Ensley, McMinnville, hydraulic motor; Charles H. Vandenburg, Florence, plow; Washington—Russell Avery, Spokane Falls, three patents, one for a coin operated automatic hydraulic air compressor, a second for an air pump or compressor, and the third for a device for operating pumps by means of treadles; John P. Holedger, Spokane, street railway switch appliance.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FEEDERS FOR COAL, ORE, ETC.—Louis Rosenfeld, N. Y. No. 482,652. Dated Sept. 13, 1892. The invention relates to that class of feeders for ore, coal and other material in which a supply-hopper is provided with devices for apportioning and regulating the charge fed therefrom. The main object of the invention is to provide simple and effective means for regulating the charge of material fed from the supply-hopper or bin and controlling its delivery. The particular object is to provide for simultaneously screening and delivering any stated quantity of coal from the bin and with the required speed to permit proper screening and safe delivery.

LUBRICATING-CUP.—Ira J. Briggs, S. F., assignor of one-half to A. W. Sanhorn. No. 482,674. Dated Sept. 13, 1892. This lubricating-cup is especially useful upon engine cylinders and in other places where there is a pressure of gas or vapor against which the oil or lubricating material is to be introduced. The lubricator is automatic and there is no chance for the escape of steam through it.

APPARATUS FOR THE PROPULSION AND TRANSMISSION OF WATER.—Marx P. Schetzel, S. F. No. 482,655. Dated Sept. 13, 1892. The invention is designed to be used for the propulsion and transmission of a body or column of water by means of a revolving disk having inclined or propeller-like overlapping blades, which blades extend over each other, and a chamber through which the water is either drawn by suction or pressed by force. The invention is used as a pump for raising or forcing and transmitting water, and also for the purpose of propelling vessels.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

ALAMEDA QUICKSILVER MINING CO. (of Chihuahua, Mexico). Capital stock, $100 000. Directors, S. M. Thanhausser J. L. Bradbury, W. E. Davis, R. B. Harper, F. W. W. Gollin and A. Krakauer.

FAUIT PEST EXTERMINATING CO. (San Jose). Capital Stock, $10,000. Directors—W. E. Ward, George W. Sill, J. R. Roberts, Henry Singleton, Henry Booksin, Jr., A. Miller and F. C. Strong.

WEEKS FISHING CO. Capital stock, $25,000. Directors—George Fogel, Albert Rowe, Daniel Hayes S. F. Weeks and J. G. Staiger.

KARLUK RIVER FISHING CO. Capital stock, $25,000. Directors—George Fogel, Albert Rowe, D. E. Hayes, S. F. Weeks and John J. Staiger.

GARDINER GENERAL ELECTRIC CO. Capital stock, $750,000. Directors—R. N. Graves, W. P. Wilder, William Van Bocklin, J. B. Gardiner, and Jacob Stadtfeld, Jr.

ACAMPO ORCHARD CO. (Sacramento). Capital stock, $80,000. Directors—P. E. Platt, M. N. Williamson, J. W. Barrett, H. R. Martin, F. G. Ryan, A. W. Porter, J. H. Platt, William Johnston and George M. Mott.

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San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13½	English, lb	— @ 18
BORAX.		Canton tool	— @ 8½
Refined, in car lots	— @ 7½	Bik Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	1½ 10
Concentrat'd, do	— @ 6½	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 5 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 5 87½
Firs Box Sheets	22 @ 24	Do, do, 20x28	— @11 75
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot ₱ lb	— @ 22
Norway, bass	— @ 4½	**COAL**	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton ₱ ton	22 00@— —	Wellington	$8 00
Glengarnock	23 00@— —	Greta	6 75
Am. Soft, No 1	24 00@— —	Nanaimo	7 00
Oregon Pig	—@— —	Gilliman	6 00
Puget Sound	—@— —	Seattle	6 50
Clay Lane White	24 00@— —	Coos Bay	5 50
Langloan	22 00@— —	Cannel	8 50
Thornoliffe	23 00@— —	Egg hard	11 50
Gartsherrie	22 00@— —	Cumberland, in sacks	14 00
Barrow	22 00@— —	Do, bulk	13 00
Cargofleet	22 00@— —	Wallsend	7 00
CHROME IRON ORE.		Scotch Splint	7 00
Per ton	10 00 @— —	Brymbo	6 75
LEAD.		West Hartley	7 60
Pig	— @ 4½	TO LOAD—PER TON.	
Bar	— @ 5½	Australian	5 75@— —
Sheet	— @ 7	Liverpool Steam	6 00@— —
Pipe	— @ 6½	Scotch Splint	6 00@— —
SHOT.		Cardiff	6 25@— —
Drop, sizes *smaller* than B, ₱ bag of 25 lbs	$1 85	Lehigh Lump	12 00@— —
Do do, B and *larger* sizes ₱ bag of 25 lbs	2 10	Cumberland	9 00@— —
Buck, Balls and Chilled do, ₱ bag of 25 lbs	2 10	Egg, hard	10 00@— —
QUICKSILVER.		West Hartley	6 50@— —
Home trade, pr. flask	41 50 @42 00	**COKE.**	
For export	35 50 @36 00	English, to load	$8 00@ 9 00
		Do, spot, in bulk	—@10 00
		Do, in sacks	—@12 00
		Cumberland	9 00@— —

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Send references, experience and salary wanted to

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Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Dr.	Cr.		Dr.	Cr.
BODIE MINES			Con. Imperial	2,388	— —
Bodie	— —	16,248	Confidence	2,761	— —
Bulwer	— —	9,0 8	Crown Point	2,469	— —
Bullion	— —	3,151	Caledonia	— —	4,486
Standard	— —	40,11	Ch llar	— —	18,410
Syndicate	— —	1,461	Con. New York	— —	7,253
TUSCARORA MINES.			East Sierra Nev	— —	15
Belle Isle	7,8 6	— —	Exchequer	— —	8 510
Commonwealth	23,7 9	— —	Gould & Curry	— —	8,690
D l Monte	22 107	— —	Hale & N rcross	18,336	— —
Diana	— —	76	Julia	— —	5,552
Grand Prize	5 674	— —	Kentuck	— —	3,253
Judepen len c	306	— —	Lady Washington	— —	6,113
Navajo	9,716	— —	Mex can	— —	10 518
Nevada Queen	8,2 7	— —	Occ dental	11,347	— —
North Belle Isle	19,1 9	— —	Ophir	— —	16,124
N. Commonwealth	— —	2,2 9	Overman	9,1 8	— —
COMSTOCK MINES			Potosi	15,635	— —
Alpha	— —	14,083	Silv r Hill	— —	428
Alta	— —	18,752	Savage	*13,825	— —
Andes	— —	11,810	Seg. Bel her	— —	4,249
Belcher	— —	9,369	Sco ion	— —	3,950
Bullion	13,503	— —	Sierr. Nevada	— —	18,102
Best & Belcher	— —	2,483	Union	— —	49,488
Coa. Cal. & Va	— —	14,9 8	Utah	— —	3,679

†With $1260 due the pumping association.

*Less overd aft of $318.96 at Nevada Bank, with more bullion to be received.

‡With bullion in refinery valued at $5516, and 13,437 pounds of ore concentrates unsold, the value of which is undetermined

¶ With bullion, amount unknown, to be received

1 Less $2200 proceeds of sale of ore in transit, and $1300 due on pumping account.

2 But since September 1st the company has received $9000 as the proceeds of ore sales.

3 With a bullion shipment valued at $11,836 56 advised since September 1st, and more bullion to come.

Eastern Metal Markets.

NEW YORK, Sept. 22.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38½	83	11 00	4 05	20 20
Friday	38½	83½	11 00	4 10	20 25
Saturday	38½	83	11 00	4 05	20 25
Monday	38½	83½	11 00	4 05	20 25
Tuesday	38½	83	11 00	4 00	20 25
Wednesday	38½	83	11 00	4 00	20 15

Quicksilver is barely steady. Borax continues to meet with a good cholera demand. Pig iron appears to have a steadier tone. Copper continues to favor buyers.

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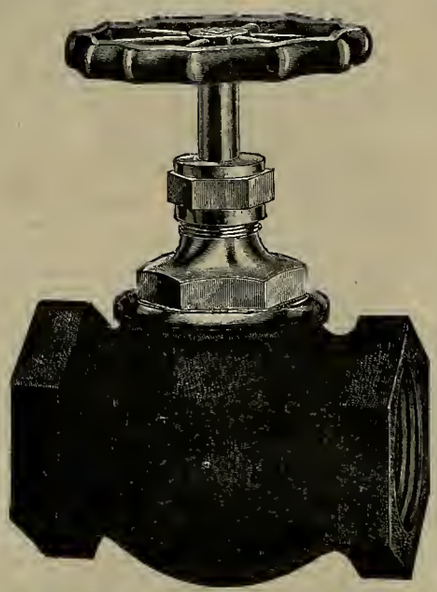

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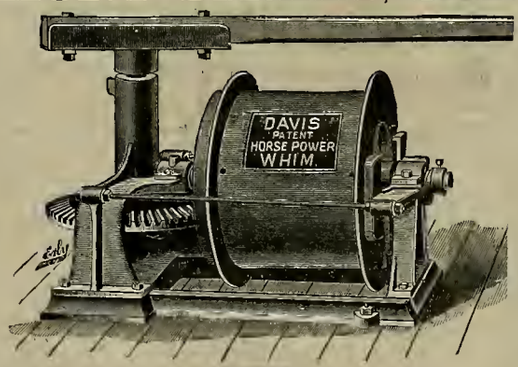

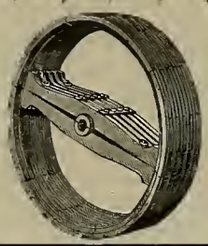

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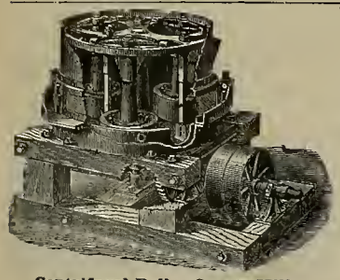

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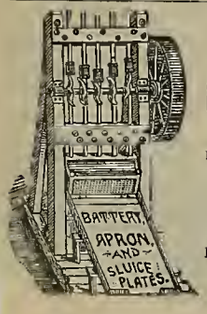

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VOL. LXV.—Number 14. DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, OCTOBER 1, 1892.

Three Dollars per Annum. SINGLE COPIES, 10 CENTS.

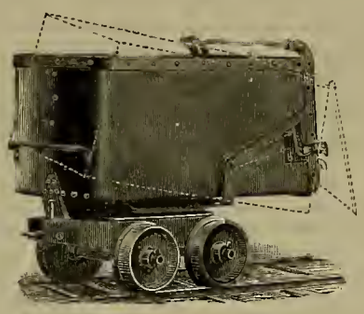
Propeller Boats Without Steam.

One of the daily papers of this city, in its "waterfront notes," says there is complaint about the naptha and gasoline launches, now increasing so rapidly, and maintains that they are a nuisance, because anybody can go as captain as they do not come under government laws. The suggestion is also made that the laws pertaining to steam vessels be amended by the next Congress to cover this new power. This is all nonsense. The vapor launch, like the safety bicycle, has come to stay, and is a modern mechanical device rapidly growing in favor. Under the Government laws it is almost impossible for any one to have a steamlaunch. The laws for them are precisely the same as apply to a big steamship. There must be a licensed engineer and a licensed pilot, etc., and the restrictions and regulations are such that few can afford to run the boats. This is simply because they have a steam boiler afloat. The Government then has more to say about running the boat than the owner. But the vapor launches, having no boiler, are independent of the Government. Any man can own and run one himself without interference. This he cannot do with steam, for the laws require the employment of licensed engineer and pilot.

The professional marine engineers take good care that no amateur obtains a license to run a steam-launch, and as a result few steam-launches are built. But with the new power neither the engineers nor Government can interfere and hundreds of the launches are being built. The engines for utilizing the gasoline are of California invention and manufacture, and are very successful. They are built small enough for a hunting boat or large enough for a good-sized yacht. Simple in construction, cheap to build and run, easy to handle, it is no wonder they displace steam in their field. The boat can be started at a moments notice, no time being lost in getting up steam as in the ordinary type, and, best of all, the owner can run his own boat without interference from officials or labor unions. Under these circumstances, calling this type of launch a nuisance because a few waterfront people object to it, is mere foolishness. Horse-riders and drivers wanted bicycles kept off streets and roads at first, but the courts decided they had as much right there as the horses, and now they are universal. The gasoline and naphtha launches have their rights on the waterways as well as sail, steam or rowboats. There is no reason whatever for the Government altering the laws pertaining to steam vessels to fit these boats. It is not because a steamboat is a boat that the Government looks after it, but because it carries a steam boiler. These boats do not require any more inspection or red-tape rules than a white-hall boat or yacht, or scow-schooner. They can keep out of the way of other craft easier because they are independent of wind, tide or muscle, and can back as well as go ahead. There is no need to inspect them or to require that the licensed member of some labor union should be in charge. They are bound in time to displace the old-fashioned small craft propelled by oars, such as white-halls, etc., and this is one of the reasons why there is a prejudice against them among those whose interests are involved. But the vapor-launch is a labor-saving, time-saving and money-saving device which has pushed its way to the front, and will be liable to stay there. Of late this class of engine has been put into small, bay-trading craft.

An Automatic Ore Car.

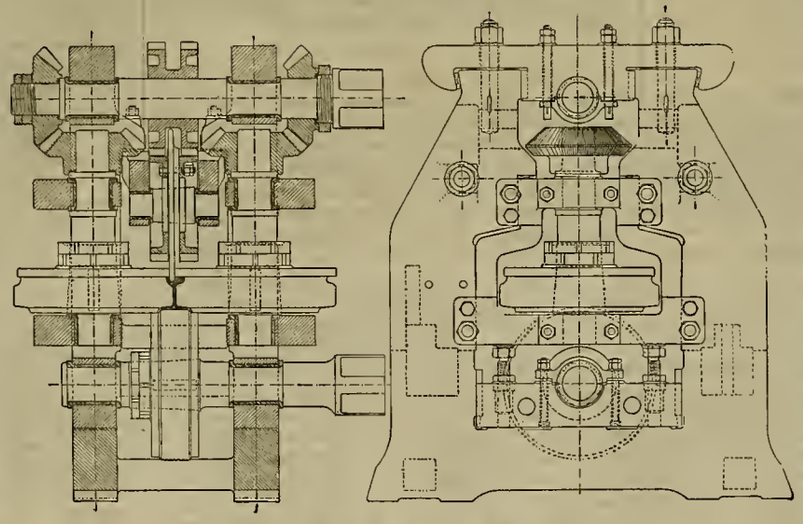
The Odin Mining Co., of Nevada City, Nevada county, have lately purchased some ore cars from the Parke & Lacy Co., agents in this city, which are different from any in use on this coast. They are known as the Truax automatic ore cars and are made of the best quality of steel and malleable iron with cast chilled wheels. As will be seen from the engraving, the automatic opening and closing door does away with the lever in the back and all its



THE TRUAX AUTOMATIC ORE CAR.

disadvantages. The car cannot be dumped without opening the door, and its opening gradually. The door does not commence to open until the bed of the car is at an angle of four degrees from the track, and from that on until the bed of the car is at an angle of 12 degrees. The door is held by two catches and a crossbar and opens gradually, thereby giving the benefit of the weight of the ore to the front part of the car to aid in dumping. The old style car door had to be opened before starting the dump, thereby letting about one-third of the ore fall out, thus increasing the weight to be raised to dump.

The door-catches start to catch the door when the bed of the car is at an angle of 12 degrees from the track, and from that time until it is closed down it acts somewhat on the principle of a wedge, making a tight fit of door and car. By the aid of the automatic door holding the ore in the car until partially dumped, we are enabled to set the trucks farther toward the door end, affording an easier dump than the ordinary car, and distributing the wear on the axles more equally. The step and catch are made in one solid piece and are so attached as to prevent the spring from becoming inoperative from ice or mud. The step and catch are attached with a bolt through the truck frame and step, so that by taking out the bolt the step comes out, affording easy access to the spring. The car works with a swivel, so that it can be dumped on either side as well as to the front.



FINISHING ROLLS FOR GROOVED RAILS.

To Secure Harmonious Action.

The clause in the Camminetti mining bill which provides that joint work may be done in the rivers under certain conditions, by the State engineers and those of the National Government, has been misconstrued by many as an attempt on the part of the originators of the bill to deliver over to the State the control of the river and harbor appropriations made by Congress. The object really is to secure harmonious action between State and Government engineers. If the State wishes to assist the Government, it may do so under the bill, but every step must be approved by the Chief of the U. S. Engineers and the Secretary of War as well. The Government engineers themselves advocate this system of cooperation. They have insisted that reclamation and improvement should go hand in hand, for unless this were done, one reclamation district would necessarily work at odds with another. Under the provisions of this bill, land reclamation and river improvement can be carried on by joint work on the part of the two sets of engineers. This is a sensible plan, and has advantages for both State and Federal Government.

Rolling Grooved Rails.

In the arrangement of modern rolling-mills abroad it has been earnestly sought to develop the old-fashioned crude trains into carefully-constructed machines, the gearing of which should not rattle loosely, but transmit power without loss, while the rolls should be placed with fine accuracy, and the pieces to be rolled should be moved back and forth in the precise predetermined position. In the latter respect, the rolling-mill at Phœnixhutte, Germany, may be adduced as a good model. Here, the liquid pig from the blast-furnace is transformed into ingot-iron in the converter, recarbonized and cast into ingots. These are annealed in Gjers soaking-pits, then removed by an automatic lever and delivered to a train of live rollers, which carries them to the blooming-mill, from which they pass to the bloom-shears and to the rolls without having required, since the metal left the furnace, a single pound of coal to be used upon them. Where room is lacking in the rolling-mill—which is very often the case in the older establishments since the requirements as to length of rolled pieces have been steadily advancing—feed-roller trains are used which incline upward and often extend far above the roof. The space below is thus saved for other purposes. Many mechanical devices have been put in use for the treatment of ingot-metal. In making the rails for street-railways, the ingot-metal rails are often rolled solid, receiving only in the last pass the necessary groove. The machine for doing this is shown in the accompanying cut.

PROF. GEO. F. BECKER, geologist, and Edward A. Schneider, chemist, both of this State, are among those on the U. S. Geological Survey whose resignations have been asked for and accepted by the Director.

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Our latest forms go to press on Thursday evening.

San Francisco, Saturday, October 1, 1892.

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Steam Engines—W. H. Ohmen.
Wire Rope and Wire Goods—Washburn & Moen Mfg. Co.
Water Wheels and Quartz Crushers—Pelton Water Wheel Co.
Concentrator—Geo. E. Woodbury.
Quartz Mills and Ore Feeders—F. A. Huntington.
Electrical Machinery—Electrical Engineering Co.
Mining and Irrigating Pumps—Trowbridge & Dykes.

☞ *See Advertising Columns.*

Comment.

It is very evident that the electric railroad of the future will have to be on the conduit or storage battery system. Notwithstanding the arguments of the advocates of the trolley system, there is a prejudice against its adoption on the crowded thoroughfares of large cities which cannot be set aside. There is a menace in that pendant live wire which people object to. Every one is willing to admit that the trolley system answers very well as far as propelling the cars is concerned. It is cheaper in original outlay than the cable-road, but that it is cheaper to operate where there is heavy traffic is open to doubt, to say the least. If overhead wires on the roads were always kept in as good order as when first put up, there ought not be such serious objections to them. But when they wear so as to break frequently, the companies are not apt to renew them as promptly as they should. With cables, they must be kept in first-class order, and be renewed at certain known periods, or the whole road comes to a standstill. On an electric road in Oakland, not many months in operation, the writer saw last week the whole mass of wires at a curve near the end of the road, come to the ground at once. The conductor and motorman had to stand there for some time to keep children away from the dangerous wires. Where there is liability to such accidents as these, there will always be objections to the trolley. With the wire underground out of the way, or with the storage battery plan, the electric roads would grow in favor in the cities where they are now kept out. In this city only last week one road had to put up its wires at night, in opposition to the edicts of the supervisors, but under a court decision dissolving an injunction. With a more popular system of delivering the current to the motors on the cars, there would be no necessity of any such work, for the electric cars would be welcomed. There are many at work on plans for improving electric roads, and some more perfect plan than that in vogue will doubtless be the result.

On another page of the MINING AND SCIENTIFIC PRESS of this week is given the chapters of the Mexican mining law, relating to the methods of obtaining title and paying the annual tax on mining property. The idea is entirely new and will probably in time be adopted in other countries. Absolute title is given to the mining property on payment of a fixed sum for title deeds, and this ownership may always be maintained on payment of certain annual imposts. People owning mining claims in Mexico must present their ownership titles to the proper officials before October 31st, 1892, and pay for the proprietary mine stamps. This gives them undisturbed title to their ground. Then they must pay the annual tax of $10 for each claim unit, but this may be paid in three equal parts in advance in each fiscal year. Heretofore owners of mines in Mexico have had more or less trouble with the officials concerning their property, and this has been one of the great drawbacks to mining in our sister Republic. Under the new law, however, the prices to be paid are fixed at a specified sum, and as long as the annual taxes are paid no one can be disturbed or be submitted to official extortion. The receipts for payment of the annual tax are evidence of continued ownership, and form a more absolute title than the American system of affidavit of labor performed on the claim. In this country the annual tax is supposed to be spent on the mines; in Mexico it goes into the public treasury. Our system is good in theory but the plan of abandoning and relocating a mine gets around the law. Under the Mexican system there is no dodging the payment without losing title to the ground. Those portions of the law which we print in this number should be read by all who have any interest in mining ground in Mexico. The time to perfect the original title is short, and those who do not get the stamps for their title deeds this month will have a double bill to pay.

It is reported from Alaska that about 300 white men will pass the entire winter up the Yukon river, a thing never before known in that region. A few miners have occasionally stayed there, but most of them annually come back to the coast, and many return to San Francisco and pass the winter, returning early in the spring. Several pretty rich strikes have been made along the Yukon this summer, and in some places the miners are getting out from $8 to $18 per day. This no doubt accounts for their determination to stick by the diggings. The mining season in that region is short and every day counts. Nothing whatever can be done in winter, the cold being very severe. The men, however, probably want to be on hand when the first thaws set in so as to work the most of the mining season. To make anything in that region the diggings have to be rich since living is very expensive and the time for mining so short. There is enforced idleness for many months in the year. It is no place for poor men to go.

Sudden fortunes in mining are frequent, but sudden fortunes in fishing not so common. Since California began to control the whaling industry of the world, not many years ago, there has been a great change in the systems pursued. The best and most successful whalers are steam vessels and the modern explosive-bomb has entirely displaced the old harpoon. Moreover, the oil is no longer the chief object of whaling. Whalebone is what they are after, since in that there is the most money. As showing the possibilities of this industry, the last cruise of the steam-whaler Mary D. Hume (referred to on another page) may be cited. This little vessel by staying two winters at the mouth of the Mackenzie river, in the Arctic, comes back with a cargo valued at nearly half a million of dollars, breaking the record of all previous voyages. She took 38 whales. The bone is worth from $4 to $6 per pound, without counting the oil. In this case the vessel had no room for all the oil and abandoned most of the blubber, taking only the bone. Two years ago a whaling vessel brought back a cargo from the mouth of the Mackenzie river worth $200,000. Next year an almost equally valuable cargo was brought down from the same locality by one vessel. But the little steamer Hume is away ahead of them all. The lowest whaleman on the "lay" scale of this little vessel will receive not less than $2000, while the captain will get about $30,000 for his share. He is the only captain who remained two successive winters in the Arctic, and his persistency has found its reward. For the past few seasons the whaling industry has not been very profitable, but this marvelous catch will give it an impetus. The grounds about the Mackenzie river will be much hunted hereafter. The whaling fleet from the north is now on the way to San Francisco for the winter, though some of the vessels will remain in the Arctic in hopes of good catches in the spring.

THE new 80-ton State tug and fireboat Governor Markham, which was recently launched from the Fulton Iron Works' ship's ways at Sixth and Channel streets, has had her boilers and engines placed in her, and the fire-pumps will be put in immediately. Her cost will be $22,475, exclusive of the Dow fire-pumps, which are put in by special contract.

The New Anti-Debris Association.

What is called the State Anti-Debris Association, formed by five of the valley counties, met at Marysville last week and discussed the situation. "Will S. Green, of Colusa, was called upon, and he showed how a tax of 10 cents a year on $1000 of the taxable property of the counties interested would raise nearly enough to carry on the fight. The people of the several counties have not been educated up to this matter, and their papers have not taken hold of it in the right manner." Notwithstanding Mr. Green's statements the fact is, the people have been educated up in this matter, but not in the direction Mr. Green desires. They realize now that if the miners can work without injuring them they ought to be permitted to do so, and not be persecuted "on general principles." During the old fight on this subject everybody in the valley was down on the miners, and the miners themselves were rather too independent. But in these days the mutual rights are better understood. The miners no longer claim the right to mine anyhow, but recognize the fact that they must restrain their debris. They ask Congress for permission to build dams to control the debris, and the new Anti-Debris Association does not want such dams built. Debris now in the rivers will continue to come down unless dams are built, but this fact the anti-debris people ignore.

At a meeting of the Sacramento County Supervisors this week, Chairman Greer made a verbal report of the result of the meeting of the new Anti-Debris Association held at Marysville on the 22d, at which he and Supervisor Bates were present as representatives from Sacramento county. The counties represented were Sutter, Yuba, Colusa and Sacramento. Mr. Greer said that all the supervisors preeent were deeply in earnest and evinced a determination to have a stop put to hydraulic-mining. He and Mr. Bates assured them of Sacramento's support, but wanted to see more counties come into the combination—the eight that are most deeply interested—in order to lessen the expense of each. It was decided to hold a meeting in Sacramento on Monday, the 10th of October, to further consider the matter and endeavor, if possible, to get more counties interested, particularly Yolo, which has much at stake in the matter as Sacramento.

Referring to the matter of the expense of maintaining the work of the Anti-Debris Association, he said that himself and Supervisor Bates had given the others to understand that Sacramento would continue to aid in combating the operation of hydraulic mines. The expenses of the association in the past had averaged about $1000 a month, which had been borne mostly by three counties—Yuba, Sutter and Sacramento. While the contract of this county with Attorney Devlin lasts, the sum paid him ($200 a month) would be credited to Sacramento as her portion of the expense, but if seven or eight counties can be induced to join the association, the expense to each will hereafter be greatly reduced. Mr. Greer then spoke of the presence of Congressman Caminetti before the Association, who had been invited there for the purpose of explaining his hydraulic mining river-improvement bill. He said that after hearing Mr. Caminetti's explanations of its provisions, in their amended form, the members of the Association were much more favorably disposed toward it than before. It leaves the matter entirely in the hands of the Government and has certainly many good features that are worthy of careful consideration.

The fact is, if these gentlemen will take the trouble to read the bill which passed the lower House of Congress at the last session, they will see that there is an earnest attempt on the part of the miners to prevent any further damage from debris. At the same time they want to work their mines.

Mr. Caminetti's idea is to first take care of the material that now lies in the main branches of the rivers and their tributaries, which is now doing injury to the navigable streams and their tributaries, and the lands adjacent thereto. Once having taken hold of the matter, the General Government will push it to a final and satisfactory solution, if it be in the power of engineering skill and science to solve it. As early as 1882 the Government engineers appointed to examine into the question reported there was a feasible plan which might solve the question; and it was upon that basis that the Biggs Commission made their report, and, in fact, they adopted in many instances the language of the Mendell report of 1883. The recommendation of the commissions is made a part of the bill that passed the House of Representatives. A detail of engineers appointed in 1890 approve of the report of the report of the Biggs River Commission, in so far as it relates to the many streams. There is another report that corroborates and coincides with all the former reports made by the engineering department of the Government, and that was made in answer to a law passed at this session of congress, calling upon the Secretary of War to submit for the consideration of the Houses, estimates in

regard to carrying out the Biggs Commission bill; and in that it is found that they, with the approval of the Chief of Engineers and Secretary of War, go upon the theory that is outlined by those reports referred to. In all of these reports it will be found that no harm is intended to the people of the valley, and there is entire safety to the land adjoiniug the rivers; and this idea is carried out thoroughly in the law which passed the House on the 19th of July. It appoints a commission of engineers to take charge of the general subject of the rivers, including the Sacramento and San Joaquin system and the hydraulic mining that may be carried on in the country drained by either of these streams. The main proposition and prevalent idea of it is to complete river improvements—complete river protection.

If the new Anti-Debris Association showed a spirit simply of protecting the valley interests against possible injury, no one could object to its mission; but its spirit seems to be more in the direction of stopping the mines anyhow and not permitting dams to be built. The same men who were in the old association are in this one, and they seem to want to carry on the contest about the old lines. The time has passed, however, for that. The people generally want the controversy stopped. The miners are anxious to do the right thing if they are only permitted. The antidebris men themselves confess that they have been unable to stop hydraulic mining, and that it still continues. It would seem, therefore, that the old plans were unsuccessful. Possibly by a more liberal and less antagonistic spirit, better results could be accomplished.

Coast Industrial Notes.

ONTARIO, San Bernardino county, has let the contracts for the municipal water system.

GREAT FALLS, Montana, is to have a 500 barrel mill and elevator, which is to be built by Minneapolis millers.

AT Eel river the canneries are all busy, and more or less work is being done in the planing mill and box factory.

THE cannery at Eugene, Oregon, employs fifty hands in preparing fruits and vegetables for the market. They have canned about 80,000 pounds of tomatoes this season among other things.

THE water ditch to be built this fall in Oregon for the Canyonville Mining, Water and Manufacturing Company will he nearly fifty miles in length and will cost between $70,000 and $100,000.

WORKMEN have commenced stretching the trolley-wire for the Sessions-Vandercook electric road from the corner of Eighth street and Broadway, Oakland, to East Oakland. The tracks have been laid for some time.

Reports are made of a valuable find of coal at Chicnic bay, Alaska, half way between Sand Point and Kodiak. The prospectors have sunk a shaft and are getting out the coal. The product of the mine is said to be first-class.

THE motors and trucks for the new Fourteenth-street Electric Railroad in Oakland have arrived, and it is expected that the cars will be running from the Sixteenth-street depot to Fourteenth and Washington streets in another week.

GREAT excitement was created at Whatcom, Wash., over the report that a vein of coal fifteen feet thick had been discovered within the city limits. The vein was struck at a depth of 400 feet, and the specimens shown are of excellent quality.

THE California Wire Works Co. has asked permission of the Supervisors to build a railroad from the seawall on the waterfront to its factory, along North Point street, thence on Powell street, with privilege to use either steam or horsepower.

THE tug Katie O'Niel which returned several days ago from Port Harford where she has been towing rock barges for the work on the Government breakwater, will perform a similar duty on the Oakland harbor improvement, her owner, Patrick O'Niel, having entered into a contract for the work.

Vancouver, B. C., has given the Burrard Inlet and Fraser River Railroad Company a subsidy of $300,000 on condition that it construct a railroad from Burrard Inlet to the United States boundary at Sohome bay. The road is to be completed before June 30, 1894. The company agrees to erect machine and repair shops at Vancouver.

Messrs. Harlan, Green and Bartlett of this State have discovered a mammoth quartz ledge at Preston Peak, 20 miles southeast of Waldo, Oregon. Several locations have been made along the line of this immense ledge, and work will be pushed vigorously in the spring. The locality is high up in the Siskiyous, where the snow lies in drifts to a depth of fifty feet. The region, although inside the California line is only accessible by way of Grants Pass, Oregon.

THE Metropolitan Electric Road, which is to run all the way to the ocean, is so affected by its franchise that only a five-cent fare can be charged between the city and the ocean. To go out to Southside will necessitate the doubling of the power. On motion of C. W. Pope, president of the Southside Improvement Club, a subsidy of $125,000 was voted to extend the road from its present terminus at Eighth avenue, via T and Forty-eighth streets, to the park and ocean.

THERE are in this city at present many idle coast-seamen and deepwater sailors. There are not enough coasting vessels now on commission to furnish employment for them and now the winter is coming on, matters will be worse. There are many deepwater ships waiting for wheat, so that the sailor boarding houses are filled with men out of work, and they are taking the places of the coast-seamen when they can.

A new granite quarry belonging to J. J. Stone, fifty miles east of Spokane, is having spur-tracks built to connect with the Northern Pacific railway. This quarry is to furnish the stone for the new municipal building at Spokane. Nelson Bennett, of Tacoma, the lowest bidder for the government naval docks at Port Orchard, as soon as the contract is ratified, will order the granite in the construction of these docks, from Mr. Stone's quarry. This will entail another additional force of workmen at the quarry and will probably increase the number to three or four hundred men.

AT present over 175 tons of bitumen are hauled daily from the mines of the Bituminous Consolidated Mining Company up the coast from Santa Cruz, and there are orders for 10,000 tons to be hauled before the rains set in. Santa Cruz bitumen is being laid on First street, San Jose, from Santa Clara street to the hotel Vendome, about 1¼ miles, and also at Stockton, Alameda, San Francisco and Oakland. Recently 2,000 tons have been shipped to Salt Lake, to be used for street purposes. From the Enright mine about thirty tons are hauled daily, bringing the output to over 200 tons.

Under the authority of the last naval appropriation bill, providing for the construction of an 8000-ton seagoing battle ship, and an 8000-ton armored cruiser, proposals were on Wednesday issued for their construction. The battle ship must have an average speed of sixteen knots an hour, and the cruiser twenty knots. The speed is to be maintained successfu ly for four consecutive hours on the trials. The vessels must be completed within three years from the date of contract. The Union Iron Works of this city will bid on both vessels, with a good chance at least of getting the battle ship to build.

ALL the firms and establishments engaged in the bottling of Fredericksburge beer in the city have combined. They have pooled all their issues and will he known under the corporate name of the "Fredericksburg Bottling Company." The corporation will have a capital of $100,000, all of which has been subscribed. It appears there are five different concerns operating in this city as bottlers of Fredericksburg beer. Over 150 men are employed among them and each establishment is under the expense of having independent management, The entire work will hereafter be concentrated at one establishment, and the four other places will he closed.

CHAS. E. UREN is now engaged in making surveys for the dam and canal of the Electric Power Company, which will obtain its power from the South Yuba river. The dam will be located about two miles above the Purdon bridge, at a point where high rock cliffs narrow the stream. The bottom of the dam will he less than forty feet in width, but nearly 150 at the crest of the dam, which will be 27½ feet in height. The work of building the dam is to be pushed to completion before the rainy season sets in. The construction of the canal will be carried on through the winter. Much of this work will he fluming, owing to the steep hillsides along which it will have to be carried.

The tunnel on the Great Northern under the summit of the Cascade mountains will be 13,000 feet long instead of 8,000, and will require three years to complete it instead of one. When completed it will be the second longest tunnel in the United States, the first being the Hoosac tunnel in Massachusetts, four and one-half miles long. The final location of the tunnel is now being made by A. M. Lupfer, resident engineer. The switchback over the moutain has been located and is now under construction. At one point the line passes back and forth six times on the same side hill. The difference in elevation between the summit and the point where the switchback joins the main line is 1,000 feet.

THE sea otter schooner Pearl returned Tuesday from her cruise north with sixty-eight skins, and bringing news of the season's catch, which has been most successful as well as profitable. The Pearl is eight and a half days from Kodiak island, and her skins were taken in the vicinity of that and Sanak island. Captain Littlejohn spoke the sea otter schooner Helen Blum, Captain Coulson, with ninety-one skins, which makes her "high hook" of the season; the schooner Herman with seventy-eight skins, the Alexander with fifty-six skins, and the St. Paul with fifty-one skins. These vessels fitted out here last February, and the news that came Tuesday put the owners of the vessels in high spirits. Sea otter skins bring from $175 to $250 apiece, so the catch is worth considerable.

MEYER & AKMANN, agents of the steamer Emily, have a contract to transport 400 tons of steel rails to Marshfield, Or., for the Coos Bay and Roseberg railroad, which is to be built as soon as possible to Coquille City, a distance of about twenty-two miles. The road is already built ten miles out of Marshfield and graded for eight miles more. The steamer on her last trip brought down from Port Orford, Or., 200,000 feet of piles, which were landed in Oakland creek, where they will be used in building the wharf for the Adams estate at the foot of Jackson street. The Adams heirs are building 1600 feet of wharf frontage, alongside of which they will have a depth of 22 feet of water for shipping purposes. Much of the timber is on the ground and the contract for dredging will be let on Tuesday next.

THE steamer Bertha brought news from the Artic this week that the steam whaler Mary D. Hume was on her way down the McKenzie river with bone and oil representing thirty-eight bowheads. The catch is the largest on record, notwithstanding that it represents two seasons's work. When the Hume left here in April of 1890 to winter at the mouth of the McKenzie river there was considerable misgiving over the experiment. No one ever anticipated anything like such success as she has had, and when she reported eleven whales at the end of the first season the statement was doubted until 15,000 pounds of bone arrived consigned to her owners. Captain Tilton staid another year, and the result was twenty-seven more whales, making a total value for the two seasons of between $400,000 and $500,000. The Grampus tried it last season and made a phenomenal catch, but nothing to compare with the Hume's. The Newport, Karluk and Orca arrived off the mouth of the McKenzie in June of this season, but the Hume, not having to wait for the ice to break up, had been hunting for two months and had skimmed the cream of the hunting ground. The Orca had two and the others three each when the Hume sailed, and it is possible that they may conclude to do as the Hume and stay through the winter, but this will not be definitely settled until the mail arrives here by the lucky steamer. She sailed from Dutch Harbor three days in advance of the Bertha and may he expected any day. She brings 40,000 pounds of bone and oil enough to float in. The bone taken during this season amounts to 40,000 pounds and at an average lay of 1-190th the forecastle hands will receive from $2,000 to $2,500 each as salve for their privations. The boat-steerers, boat-headers and mates will double this figure, and Captain Tilton's bit will not fall short of $32,000. The Hume only had three boats out, as against six to eight for her late competitors. They had to throw most of the blubber away having no room for it all.

Personals.

A. P. MINEAR, the well-known mining man is in the city on a visit.

P. KERWIN, the Comstock mining superintendent, is in town for a few days.

MAJOR J. W. POWELL, director of the U. S. Geological Survey, is daily expected to arrive in San Francisco.

MR. H. J. SMALL, master-mechanic of the Central Pacific R. R., came down from Sacramento on Wednesday.

GEORGE A. REYNOLDS and G. L. Bishop have come down to Stockton for the winter from their mine, the True Fissure, in Gold Valley, Sierra county.

PROF. REED, of the Cleveland University returned this week from Alaska, where he has passed the summer in scientific investigation of the Muir glacier.

SUPERINTENDENT TIBBEY, of the Parrot mine, of Butte, Montana, has earned the gratitude of the miners by the perfection of an effective system of ventilation.

JAMES L. FLOOD and Nat T. Messer left this week for the Comstock to inspect the work going on in the mines, more particularly the cross-cutting on the 1800-foot level of Hale & Norcross.

AT the meeting of the Technical Society of the Pacific Coast, on October 7th, C. A Stetefeldt, E. M., will read a paper on the "Curriculum of a Modern College; Classics vs. Natural Sciences."

A. PAGE BROWN has been appointed architect of the Harbor Commissioners. This is a newly created office, necessitated on account of the new ferry buildings that are yet to be fully planned and delineated.

F. W. DICKLE, of Pioche, has been investing pretty heavily in Monkey Wrench property, having purchased a half interest in the Cedar, Center and Big Baser. He intends to do some extensive development work in a short time.

MR. VICTOR C. HEIKES, of Salt Lake, who has spent a week investigating the workings of the cyanide process at the Mercur mill, Utah, writes us that he finds it to be a success on the ore that they mine. The mill is treating an average of 25 tons of ore per day, and their cleanup last month showed they were extracting an average of 83 per cent of the gold contained in the ore.

Building Government Vessels.

SAN FRANCISCO, Sept. 27th, 1892.

TO THE EDITOR: The MINING AND SCIENTIFIC PRESS is quite right in condemning the idiotic policy of the Light-house Department in building vessels in the interior of the United States which are designed for use in these waters. Economy and the best interests of the public service would suggest that the Board avail itself of our excellent facilities for ship building without our potential Representatives intercession, which would only serve to ruffle the consecrated oil of the Department and be regarded as a piece of sublimated cheek. It is hoped that "Columbine" will prove to he a superior vessel to her bison-back predecessors, and that if a naval officer be detailed to bring her out that she will hold together long enough to reach her destination.

Respectfully, W.

DEPARTS FOR THE EAST.—On Wednesday last Captain Jeremiah Miller, the well-known miningman, took his departure for the National Capital, where he will stay for some time. Captain Miller, who arrived in California in 1853, coming from Pennsylvania, his native State, has lived here continuously ever since, having been engaged in many heavy mining operations of various kinds in both California and Nevada. He was noted for his sound judgment and energy, a marked success having attended nearly every enterprise that he originated or ever helped to promote. He put up the first quartz-mill built in central Nevada, also the pioneer mill at White Pine, and which, beyond any doubt, turned out more bullion than was ever before produced by any mill of like capacity. Captain Miller has, during his long sojourn on the Pacific coast, experienced his full share of the vicissitudes incident to a business noted alike for its successes and its failures. His mining ventures have, however, proved generally fortunate. Where other results were reached this was largely due to disastrous conflagrations, the occurrence of unforeseen accidents, or the mistakes of others. Captain Miller, who leaves in the enjoyment of vigorous health and unimpaired business capacity, carries with him the respect of every one who ever knew or did business with him, and all of whom join in wishing him continued prosperity and a full measure of days.

The Age of Gold.

SAN FRANCISCO, Sept. 24, 1892.

TO THE EDITOR:—The age of gold is a question I have heard discussed at various times in the past, and latterly but a few days since. As a matter of course, this, like almost every other geological question, finds supporters for many theories Some gentlemen of my acquaintance believe gold to be of very recent geological age. Possibly a reason for this may be found in the recognized age of the great auriferous gravel deposits of California—the pliocene, and extending into the post-pliocene or quaternary. The age of the famous Blue Lead and the gravel deposits is undisputed, but the gold, though found in vast quantity, comparatively speaking, was by no means formed during this very recent period. That the gold found in these old channels and in the more recent quaternary alluvial deposits came originally from the quartz veins and schists of the "gold belt" no one who has investigated the matter can doubt. The age of the auriferous slates is not a point upon which all geologists agree. H. W. Fairbanks, of the State Geological Survey, seems to have collected well-founded data placing these rocks in the jurassic period. His conclusions in this regard will be found in the report of the California State Geologist for 1890.

Gold is now known to occur in many lava rocks of comparatively recent age. The rhyolites and andesites are gold hearing in many places and these rocks are usually believed to have been erupted in tertiary or even post-tertiary times, but the precious metal is found in rocks still older than any that have yet been mentioned.

It is true that gold is found in greater or less abundaoce in some carboniferous rocks and in the still older Cambrian and other silurian strata, but the deposition of the metal in these rocks seems to have resulted from the intrusion of certain eruptive rocks—rhyolite, trachyte, quartz-porphyry and other lavas of the tertiary and pre-tertiary (post-cretaceous) time—so the finding of gold under these conditions would have no hearing on its age as related to the rocks in which the ore deposits occur. In fact, its occurrence under these conditions would seem to confirm the very recent age of gold.

In the Black Hills of Dakota gold is found abundantly (that is, if a production exceeding $40,000,000 from a single group of mines included in an area 6000 feet long by about 1600 wide may be called abundant) in rocks of archæan time, the oldest known formation.

In the Homestake, the Caledonia, Golden Terra and Deadwood mines of this group occur masses of porphyry which have heen thrust up from below, and there is little doubt these dykelike masses have had a direct influence upon the deposition of the gold now found in these mines. The age of the felsite found in these mines is generally conceded to be post-cretaceous.

There exists, however, indisputable evidence that the schists and quartz of these mines were gold-bearing millions of years before the porphyry was forced in from below. This evidence is found in the conglomerate which directly overlies the archæan rocks, the unconformity being most distinct, the angle sometimes approaching 90 degrees and always being over 45 degrees. In this conglomerate, which is locally called the Gustin Belt, gold occurs under conditions almost identical with its occurrence on the Blue Lead of California. It is, in fact, a consolidated placer deposit, in which the sand, mud and pebbles composing it have been so firmly cemented as to make it a solid rock, in which the pebbles are as likely to fracture as the cementing material. The cement mines of the Gustin Belt have produced a very large amount of gold, nearly all of which was derived from the Great Homestake Belt above referred to. Not a single pebble of the felsite is found in the conglomerate and the closest inspection only leads the observer to conclude that the gold existed in the archæan rocks long before the waves of the Camhreo-Silurian sea dashed over them, tearing down the archæan terrane to build a new land. The Gustin Belt is one of the most interesting features of the economic geology of the Black Hills region and will he treated more fully in some subsequent article.

Presuming that the evidence above offered confirms the finding of gold in the archæan, it would seem that the argument that gold occurs only in rocks of comparatively recent time is wlthout suhstantial foundation.

W. H. STORMS, E. M.

Have We a Mark Twain Among Us?

TO THE EDITOR:—The terrifying suggestion has been made by a trembling friend of mine that M. T. may mean MARK TWAIN! The said T. F. fears that I may come out second best in a "keen encounter of our wits" with that redoubtable champion. In truth, I doubt if Mark Twain would do better than M. T. has done in his article of Sept. 17th, which hears internal evidence of authorship hy one who has "never dared to write as funny as 'he' can;" and if he *is* Mark Twain, of course I am in great danger.

But whatever the meaning of the mystic symbol, I warn M. T. that an arrest without a warrant is only lawful in case the culprit is caught in *flagrante delicto*. In other words, lacking the warrant of authority, a warrant must be shown in the facts and the facts must not be perverted nor misconstrued. This kind of warrant will be admitted hy everybody, for, in science, no authority is too sacred to he questioned *for cause*.

By making arrests without due grounds for such proceeding, M. T. has exposed himself to the serious charge of inciting to man's laugbter; also, of being bnt an M. T. vessel. Fortunately, these little circumstances will not diminish the value of any *new facts* which the gentleman may present to us. C. H. AARON.

Taxation of Mines in Mexico*.

The New Method of Obtaining and Maintaining Titles to Mineral Ground.

SECTION 1. Conformably to the directions of the new mining law there is hereby established a Federal Impost (tax) of mining property consisting of two parts, viz.: First, a payment in stamps, to he attached to every paper title to mining property, which may be exacted but once; and, secondly, an annual payment for each claim composing tbe grant (concession).

In determining the impost, the ground to be taxed shall he the mining claim or unit of concession, as defined by Sec. 14 of the new mining law (*i. e*, eacb 10,000 square meters.—ED.), and, as a corollary thereto, the same shall apply to all claims existing in the Repuhlic, new or old, whatsoever be their extent.

In regard to fractional claims which reach or exceed one-half thereof, the tax shall be imposed as if the unit were complete and no tax shall be imposed when the fraction does not reach the said limit.

SEC. 2. Every owner, or actual holder of a mine by any title soever, must present his evidence of ownership, without fail, after the promulgation of this law and before Oct. 31st of the current year, at the office of the Treasury as required by this law, to the end that new proprietary mine stamps he affixed, and that the extent of the claims composing the property he noted for the payment of the annual tax, which shall he registered accordingly.

The paper titles which may hereafter issue from the Department of Public Works (Fomento), conformably to the new mining law, must bear the proper stamps to be furnished hy the grantee and according to the numher of claims embraced in the grant.

SEC. 3. Proprietary mine stamps shall be of the denomination ot $10 and shall he attached to the paper title in the proportion of one for each claim of 10,000 square meters, and, for fractions, an amount as provided in Sec. 1 hereinbefore.

Said stamps must he canceled by the Treasury Officials authorized to accept titles, which may be issued up to June 30th of the current year. Such as are issued in accordance with the new law must be canceled by the Department of Public Works (Fomento).

SEC. 4. After the first of July of the current year every owner or holder of mines must make an annual payment of $10 for each claim unit embraced in his grant.

The amount of the impost shall be the same, whatsoever be the nature of the substance exploited, whether the mine was acquired before the date when the new mining law went into effect, by location (denuncio) or by special grant, or hereafter acquired hy grant and title under the new law. There shall he excepted from the payment of the annual claim tax and proprietary stamp tax as prescribed in Sec. 1, such mines as have, by Executive compact in virtue of an authorization of the Legislature or with its approval, been expressly exempted therefrom. This exemption shall continue during the stipulated time limit of the grant and shall not he extended.

SEC. 5. The annual tax of mining property shall be paid in three equal parts in advance in each fiscal year, and in the first month of each of the said periods at an office of the Treasury (Hacienda) in accordance with the requirements of this Law; and the parties owning the same must present themselves to make said payment without further notification and without delay or making excuse.

SEC. 6. Failure to present the evidence of title to a mine within the time limit fixed by Sec. 2, shall be punished hy a fine equal to the amount which the paper titles should hear; provided this he presented within the space of two months, and, for each additional two months of delay thereafter, the mineowner shall pay a fine equal to the amount of the stamp tax.

Any concealment of the numher of the claims shall be punished by a fine equal in amount to double the payment in stamps required for title on the claims so concealed and in addition to double the amount of the annual tax due during the whole time of sucb failure of payment, without prejudice to the civil or criminal responsibility which shall he enforced at the proper time. A failure to pay the annual proprietary tax within the first month of each of the said periods shall impose upon the owner of the mine a fine equal to fifty per cent of the tax, provided such payment he made within two months. If the payment be made in the third month, the fine shall equal the tax.

If the last mentioned term limit he passed without payments as aforesaid, all proprietorship in the mine shall be lost without recourse and the Department of the Treasury shall so declare and so publish in the Official Gazette in order that it may be open for another applicant.

SEC. 7. Whenever the owner of a mine shall alienate the same, he must give notice, so that record may he made thereof and so that the deed may be stamped in accordance with the Stamp Law.

SEC. 8. In the case that a person or company shall not see fit to continue the exploitation of a mine or mines in possession, written notice thereof must be given to the proper office of the Treasury in order that the tax may be paid up to the date of advice of abandonment and a proper record thereof made.

Mexico, June 6, 1892.

TITLE TAXATION.

SEC. 1. Mineral estates, now in being and such as shall hereafter be granted by tbe Department of Public Works (Fomento), conformably to Sec. 3 of the regulations of the 4th of the present month, shall be subject to the taxation imposed by this law. The mineral estates, set fortb in paragraphs III and IV of the first section of the Mining Code of Nov. 22, 1884, shall not, however, in the matter of imposts, be subject hereunto, but only to the law of June 6, 1887, and other enactments in force.

SEC. 2. The taxation of title deeds shall he paid by affixing to the last folio thereof, presented by the party interested, such stamps as are proper for papers and books, in accordance with Sec. 3 of the law. These shall be canceled in the manner therein provided.

SEC. 3. Every owner or actual holder of mines, as related in Sec. 1, is peremptorily directed to present to the head offices of the Treasury in the States, or to the offices of the Revenue in the Territories, by or before Oct. 31st of the current year, subject to the penalties imposed hy the law, the following, viz.:

I. The title papers, on which possession is based, conformably to Section 4, Chapter 6, of the Law (Ordenanzas) of May 22, 1883, and Sec. 9 of the Mining Code of Nov. 22, 1884.

II. The last title paper, transferring ownership, in case the actual owner or holder be the successor in interest of the original locator.

III. Duplicate papers, verified under oath, setting forth in detail the name and domicile of the owner or holder, and, if such be the case, of the Incorporation and of its manager or representative; the compass bearings and extent of the claims or surplus ground, with accurate measurements thereof, stating whether they be connecting or interrupted; the sum total of the original claims and surplus ground so held; the equivalent thereof in hectares, according to the terms of Sec. 14 of the law of June 4th of the current year, and of Sec. 4 of the Instructions thereunder, and, if such be the case, the reduction to writing of the title sought for by the informant, according to Sec. 4 of the provisional instructions of the said law and Sec. 8 of the law of June 6 of the current year.

SEC. 4. The presentation of the title papers, referred to in the preceding section, looks only to the identification of the mine and the verification of the claim area, expressed in hectares.

SEC. 5. The Officials, mentioned in Sec. 3 hereof, shall at once return to the party in interest one of the duplicate copies, after having noted upon said paper the day and hour of its presentation and shall forthwith affix, to the last conveyance, the appropriate stamps.

SEC. 6. Within the three days, subsequent to the attaching of the stamps by the Officers of the Treasury or Revenue Service, the official papers (expediente) shall be forwarded to the Treasury Department, which shall set forth the facts and foundation for accepting the correctness of the statements, made hy the party interested.

SEC. 7. After receipt of the information according to the terms of the previous section, the Treasury Department shall, after such investigation as may he necessary, decide whether to accept or refuse the proofs offered.

SEC. 8. In case the Department, as provided for in Sec. 6, hold the proofs offered to be correct, the paper title shall be returned to the proper Treasury or Revenue Officer to he delivered to the party in interest. The duplicate, described in Sec. 5, shall have endorsed thereon the statement that the tax has been paid.

SEC. 9 If the Treasury Department does not hold the proofs offered by the party in interest to be sufficient, the said Department shall fix the number of claims for which payment in stamps must be made.

SEC. 10. Within the three days following the day of the notification, contained in the preceding section, the party in interest must advise the Treasury Department that he accepts the number of claims fixed thereby. Allowing this period to pass shall be held to be conclusive evideoce that he agrees thereto.

SEC. 11. In case the party in interest does not agree as to the number of claims so fixed, the Treasury Department shall nominate an expert, who after inspecting the official documents, survey of the land and mining property, shall present a written opinion on which shall he based the final ruling of the Department.

SEC. 12. Having the report of the expert in view, the Treasury Department shall announce its final ruling and shall return the official document (expediente) to the Office of the Heads of Department of the Treasury and Revenue, in order that the amount of stamps which may be lacking may he thereunto affixed and notice thereof shall be entered upon the duplicate. If the case have merit, the applicant shall be referred to the Courts, conformably to paragraph II of Sec. 6 of the Law of June 6, 1892.

SEC. 13. Notice must he given to the Treasury Department, conformably to Sec. 37 of the Regulations of June 25, 1892, of all grants hereafter issued hy the Department of Public Works, upon which the proper stamps have been attached.

SEC. 14. Grantees of mineral zones, who do not avail themselves of the privileges, allowed in part second of Sec. 3 of the Instructions of the Law of the 4th of the present month, must appear in person before the Treasury Department and present, in duplicate, the documents, required by the wording of Sec. 3 of these Regulations, which shall set forth the date of the respective grants and also whether there be embraced within the boundaries of the said zone any mineral claims, other than those so granted.

SEC. 15. The Treasury Department, in view of the proofs (manifestacion), presented in accordance with the terms of the preceding section, shall demand of the Department of Public Works a written declaration thereof and sball rule according to the facts so communicated and shall give to the party in interest the authorization (resguardo) to render operative the concluding portion of Sec. 4 of the law of the 6th of the current month.

SEC. 16. In like manner, grantees of zones which include claims within their boundaries other than those granted, must, within eight days of tbe receipt of a notification from the Department of public works, present to the

*These are extracts from the new Mining Law of Mexico, relating especialty to the taxation, etc. To he issued by the California State Mining Bureau. Translated freely by W. S. Keyes, M. E., vice-president of the Bureau; Member Am. Inst. M. E., California Academy of Sciences, etc.; original Spanish document furnished by A. K. Coney, Consul-General of Mexico.

Treasury Department a declaration of acceptance thereof and the latter Department shall issue the authorization (resguardo) described in the preceding section.

ANNUAL IMPOSTS.

SEC. 17. The annnal imposts described io Sec. 4 of the law shall be collected by the Bureaus of Stamp Revenue conformably to the laws of March 31, 1887, December 9, 1891, and of others in force.

Payment must be made in Interial Revenue Stamps which shall have prioted thereon diagonally a device, contaloing the words "Mioeral Impost."

SEC. 18. The Chiefs of the Stamp Revenue Bureaus shall receive, as their only honorarium (fees), two per cent of the gross product of the sale of stamps, forming the anoual tax on the mines.

SEC. 19. The Chiefs of the Stamp Reveoue Bureaus shall maintain a record of the mines situated within their respective jurisdictions, made up from data furnished them by the Treasury Department.

SEC. 20. Owners or holders of mines shall make payments at the head or subordinate Office of the Revenue, as may be proper. But the Treasury Department may modify this regulation in the cases deemed equitable and just, after notifying the Heads of Bureaus, in order that they may advise the Chief Revenue Official in whose jurisdiction the mioe is situated.

SEC. 21. The Chiefs of the Stamp Revenue Bureaus shall see to it that the Subordinate Bureau or Agency shall, at suitable periods, forwaid an account of the stamps sold for each mine, attached to pages which expressly set forth for what mines the stamps were sold and whether the amount meets the requirements of the title papers, as indicated by the duplica'e copies thereof, furnished in compliance with Sectioos 8 aod 12. As soon as the Chiefs of Bureaus have received the said sheets, they must communicate the same to the Treasury Department, to which must be forwarded, at the end of each fiscal year, documeots composed of said sbeets, which relate to the respective mine or mioes.

SEC. 22. Each one of the three payments, described in Section 5 of the law, must be made before the 31st of July, the 30th of November and the 31st of March of each aod every year. To effect this, each principal or subordinate Revenue Office must furnish each interested party a notice which shall contain the following, viz.:

I. The words "Mineral Impost" at the top thereof.

II. The name of the State and municipality to which the office of issuance belongs.

III. The name of the mine and number of claims to be taxed; the municipal subdivision where it is situated; the name of the owner, company or adventurer in possession of the same and the number boroe by the title papers in the record.

IV. The amount of each one-third to be paid.

V. Three columns, left blank for the affixing of the stamps, due for each one-third, which must be duly canceled. The parties in interest must be careful so to place the notice, referred to in this section, in tbe office, as to be easily visible, together with the stamps, which prove the payment.

SEC. 23. As soon as each third shall, according to a preceding sectioo, have become delinquent, and as soon as the Head Office of the Stamp Revenue Bureau shall have received official notice of such failure of payment, advice thereof shall be giveo to the Agent of the Department (Fomento), in order that publication thereof may be made during one month upon the Bulletin Board referred to in Section 21 of the Regulations of June 25, 1892, which shall render effectual, for the creditors of the mine, the notification contained in Section 25 of the law of the 4th of the present month.

The creditors are not permitted to make payment of the impost until after the affixing of notice thereof upon the Bulletin Board by tbe Agency of Public Works (Fomento).

SEC. 24. In case there be no agency of the Department of Public Works within the jurisdiction of the head office of the Stamp Bureau, empowered to give the notification meotioned in the preceding article, the latter shall give notice to the creditors of the mines through the local district court, after having learned from the *Commercial Record* the names of such creditors.

SEC. 25. After the termination of tbe time limit, mentioned at the end of Section 6 of the law, without the payment of the tax, the Heads of the Stamp Revenue Bureau sball at once give notice thereof to the Treasury Department, in order that the latter may declare the forfeiture of the property, and that the Department of Public Works (Fomento) may dispose of the mine. This declaratioo must be published in tbe *Official Gazette*.

SEC. 26. The notice referred to in Section 7 of the law shall be given in writing, by the interested party, to the Head Office of the Stamp Revenue Bureau, through the hands of the suboróinate or respective agency. The Chief Officer shall advise the Treasury Department io order tbat record tbereof be made.

SEC. 27. The notices referred to in Section 8 of the law must be given in the same terms as provided in the preceding section. The Head Office sball communicate the same to the Treasury Department in order that the same may be recorded, and the proper publication thereof be made in the *Official Gazette* and form the final fiscal settlement thereof, which must he made known to the appropriate Head Bureau, in order that a proper return may be made to the applicant.

SEC. 28. The grantees of mineral zones, referred to in Sections 14 to 16 of tbis law, must, within the first ten days of tbe fiscal year, make application to the Treasury Department, in order that the latter, in view of tbe documents (expedientes) to whicb the said sections refer, may issue to them the authorization (resguardo) whicb exempts them, during tbe fiscal year, from the payment of the mineral impost.

SEC. 30. For the preseot year only, the payment of the one-third, due in July next, shall not be exacted in that month, but the parties in interest may make the same on any day of the months of August, September or October, or they may make payment in full before the 30th of November of the two-thirds due at that date.

Mexico, Juoe 30, 1892.

The Intelligence of a Horse.

Can a horse reason, or does he act solely from instinct? Many believe that he has reason and intelligeoce; others attribute all his acts to instinct. As a help to elucidate this question, I wish to present the readers of *Science* the following statement of facts based oo long and close observation:

I have a horse, now 19 years old, that I have owned 13 years. I have used him all this time, almost every day, harnessed to a buggy, in going back and forth to my office. He is very gentle, good-natured and kind, and has never shown any vices. Soon after I commenced using him I noticed that on Sundays, wheoever I drove him down town, he strongly insisted, by pulling on the lines, on going to the church where I had been in the habit of attending. I watched this disposition constantly after that, and on every Sunday since, when driven out, he has continued to do the same thing, and, if left to his own will, invariably goes to the church and stops. I thought it possible that he was guided by the ringing of the church bells, and tested him by driving him down town at all hours of the day, before and after the ringing of the bells, but the result was the same. He invariably insisted on going to church on that day, no matter how often I drove him down town. My office is one block west and one north of the church, and a half-mile west of my residence. In going to church, I usually turo south one block east of the office, but I sometimes go around by the office, where I usually drive him every morning and afternoon. In going to my office, he never offers to go to the church except on Sunday, but on that day he invariably begins to turn south to the street leadiog to the church, from fifty to a hundred feet before reaching the crossing, and, if not checked, turns into the street and hurries to the church. He has kept this up for at least 12 years. He never does this on any other day than Sunday. In bad weather or good weatber it is the same, although at the office much of the time he has had stable protection from bad weather. On week days be often insists on going to the stable in bad weather, but on Sunday, even when I compel him to go by the way of the stable, he pulls over to the opposite side of the street and hurries on to the church, if permitted, though he may have to stand out in the cold, rain or snow.

Sometimes, from one cause or another, he has not been taken away from home from one to four weeks, and I supposed he would lose the run of time, or at least show some hesitation and uncertaioty; but not so. On the first Sunday after I drove him out, he insisted, as before, on going to church. He never offers to go there any other day of the week, though the churcb bells are rung and numerous services are held nearly every day.

If on Sunday I go to the postoffice, which is on the northwest corner of the street-crossing, where we usually turn south to the church, instead of going from there direct to the office as on other days, he turns to the soutb and goes to the churcb. He never willingly goes to the postoffice on Suoday, but always stops there on week days of his own accord, if permitted. Many times I have taken other streets on Sunday and approached the church from other directions, but in all cases, when left free, he invariably takes the first street leading to the church. I have experimented with him very largely in this respect, with a view to learning how he keeps the run of time, but am unable to satisfactorily account for it. I have also observed and experimented with him in a great many other ways, and have taught him to know the meaning of many words.

When alarmed at aoything, he looks back to me with a frightened look, as much as to say: "Will it harm me." On my saying, "All right, go on," he moves on. If much frightened, he will repeatedly look back for assurance from me.

He knows the meaning of many words, such as office, postoffice, schoolhouse, mill, farm, cemetery, church, apple, corn, grass, water, and many others. The fact tbat he knows the meaning of these words, or at least attaches a meaning to tbem, I have tested many times in many ways, the relation of which would make tbis paper too long. When his corn is about used up, if I speak of it to him aod say, "Deck, your corn is out; you must go to the mill," even before starting from home, he turns in at tbe mill as I go by, and goes up to the office door wbere I have been in the habit of ordering bis food. Sometimes I have forgotten it by the time I come opposite the mill, and would have gone by, but he has not forgotten it and turns in. If I say to him, "Do you want an apple?" of which he is very fond, he puts on the most wistful look and does all in his power to say that he does; and if the apple is not produced at once, he begins to explore my pockets and clothing with his nose in search of an apple suspected to be concealed about my person. If I say to him, "Do you want grass?" he at once shows that he expects to be turned out upon pasture.

He also knows a number of people by name, and where they reside, and if told to stop at the residence of one of them, naming bim, he will do so, without any guiding.

Tbese are only a few of the many evidences of his intelligence. Hundreds of examples might be given showing bis knowledge and intelligence, and that he gives very close attention to and understands what is said to him.

Do not these facts strongly indicate that the horse has more than mere instinct, that he reasons; tbat out of the storebouse of his knowledge and experience he forms conclusions, thoughts, purposes and plans. He understands certain symbols, such as words; he keeps the run of time, and knows uniformly when Sunday comes, for be has not made a mistake in this respect for more than 12 years past; he uses many and diverse means for makiog his wants koown.

Iostinct is supposed to imply inherited knowledge of objects and relations in respect to which it is exercised, and will usually, if not always, operate where there is no experience to guide. But this horse's knowledge, in these respects, has not been inherited, but is acquired. He never was at this church till he was six years old. His mother was probably never there. In instinct there is no necessary knowledge of meaos and ends implied, though such knowledge may be present, but instinct is always manifested in like manner by all individuals of the same species, under like circumstances, which is certainly not true io this case.

Hence I infer that this horse does reason; that he has a high degree of intelligence, even much more than he is able to make us understand and appreciate.

But does the fact of his observing Sunday imply a moral sense? Why does he seek to go to the church on that day? It has been said that animals do reasonable things without having the gift of reason; that they do things involving distant foresight without having any knowledge of the future; that they work for that which is to be without seeing or feeling anything beyond what is; that they enjoy but do not understand; that reason works upon and througb them, but is not in them. The facts that I have related and observed make me greatly doubt many of these statements. I find it hard to sharply define the limits between instinct and reason. The facts that I have related indicate reason, intelligence, motives, and the formulation of plans, methods and schemes for carrying out preconceived purposes. Some of the acts, at least, indicate pure reason based upon former and remembered sensations, perceptions and knowledge, and the purpose to gratify merely mental desires.

What motive does this horse have for going to church every Sunday, even at a sacrifice sometimes? It is not for rest, it is not shelter, it is not feed, it is not company, it is not to gratify any merely physical want, for all these things he has elsewhere every day. Is it not purely an intellectual or moral want that he seeks to gratify? He stands near the church door, bears much of the exercises, especially the singing, and will remain, almost without motion, whether tied or not, till the services are over and I am ready to go home. But it cannot be for the mere speaking and sioging that he hears there, for he often hears speaking, singing, coocerts, the Salvation Army, and music of various kinds while he stands tied at the office on the public square; but none of these take the place of his church-going.

These facts I have given as tending to illustrate and explain animal intelligence. I have given only such as I have verified many times.—T. B. Reddiog in Science.

Bitumen in France.

Certain districts in Auvergne, France, are very rich in deposits of bitumen. There are three varieties equally abundant, the liquid, bituminous limestone, and the bituminous sandstone. The mineral is met with at a few feet from the surface. The seams of bituminous limestone are in some places 200 feet thick. The mines have never been worked beyond 80 or 100 feet. The mineral gives oil and gas by distillation, but as experiments have been made only on the bitumen near the surface, of course it gave but small quantities of light oil. The bitumen extracted by boring deeper contains more volatile oil. At a deptb of from 500 to 600 feet inflammable gas comes up through the bore. The only use to which the mineral is turned, at present, is for the manufacture of paving-blocks. The bituminous limestone is used for this purpose; it is crushed into powder, a small quantity of liquid bitumen and sand added, and then the mixture is put into molds and submitted to very high hydraulic pressure, and the blocks thus turned out are in the form of bricks or tiles, as required. They resist perfectly well the action of heat; the trials made in different towns where they have been employed for paviog the streets have turned out most satisfactory. The work is very neat, and it costs less than the ordinary paving-stones. The boring in search of petroleum cootinues very slowly, on account of the pressure of the gas which drives up the sand and soil into the tubes to a height of 100 meters and prevents the working of the bores. It is tbought they lack the proper machinery for the purpose, also the necessary experience in such work. There can now be no doubt about oil existing at a certain deptb; it comes up already on the surface of the water. There is an opportunity for experienced capital to test these deposits of bitumen, which, it is believed, would yield good returns for the investment.

AT the annual meeting of the stockholders of the Grand Prize Mining Company, 75,080 shares were represented, and the following officers elected for the ensuing year: William C. Ralston, president; Thomas Cole, vice-president; William Bowers, H. Zadig and H. H. Noble, directors. R. R. Grayson was reelected secretary and his financial statement showed an overdraft of $3231.50.

THE Eagle Lake, Land and Irrigation Company has purchased all of Hutchinson & Leavitt's irrigation system. This combination affords water for immediate supply, and makes one of the largest irrigation systems in the State. Great progress in the development of Honey Lake valley is now expected.

AT a special meeting of tbe directors of the Savage mining Company it was resolved to ask the directors of the Norcross Mining Company to hold a joint meeting with them for the purpose of trying to arrive at some conclusion relating to operating both mines through one shaft.

Mechanical Progress.

Antifriction Bearings.

The subject of antifriction bearings is attracting considerable attention in England as well as here, and a paper on the subject was recently read by Mr Killingworth Hedges before the mechanical section of the British Association, which is thus reported by *Engineering:*

Mr Killingworth Hedges next read a paper on "Antifriction Materials for Bearings Used Without Lubricants." After referring to former inventions and practice in this field, the author went on to describe experiments he had made, which led to the introduction of a material which he referred to as carboid. This was composed of finely-powdered carbon mixed with steatite, the mixture having the advantages of plumbago as regards lubricating properties, but showing little signs of wear after tests extending to two years' constant use. Prof. Unwin's experiments with the material show that the coefficient of friction is independent of the area of contact, and only increases if the temperature becomes excessive, but not with increased pressure. It tends to diminish with increased speed. The first cost of a dry bearing is less than with brass or patent metal. Besides the economy secured by the absence of lubricants, there is a saving in wages required for oiling and cleaning. The other objections incident to lubrication are, naturally avoided. Up to the present the chief use of carboid has been for steam-heated rolls. It has also been used experimentally with success for light-rolling stock generally.

In the discussion Prof. Forbes said that some time ago a Philadelphia company gave up using plumbago alone as a material for bearings and adopted "fiber graphite." As a *tour de force*, a steam engine was constructed in America, in which all rubbing surfaces were fiber graphite, there being no oiled-bearing. There had also been spindles running for months at 10,000 revolutions a minute. He had also seen a file working in a graphite bearing as smoothly as if it had been a turned journal. The graphite filled up the cuts in the file and rendered it smooth. He thought that the heating of the bearing described would be considerable, because it was a bad-conducting substance. The Philadelphia company found that the fiber graphite would not work if subject to heavy pressure.

Mr. Jeremiah Head pointed out that the bearing, which had been handed round at the meeting, soiled the fingers if rubbed lightly. This showed that the material would wear away, and it would be interesting to know to what extent this was consistent with the claims made by the author. It was well known that if extreme hardness and smoothness could both be insured, a bearing would run without lubrication.

Mr. Hedges in reply said that the longest period his bearing had run was two years, and the wear had been very small. In a pulley-bearing on a rope tramway, the wear after three months was only one-thirty-second of an inch. This, the engineer to the line had said, was a remarkably good result, especially as the pulley was situated on the summit of a hill, where the duty was very trying.

Prof. Unwin said that he had had one of these bearings under test and subject to a considerable range of conditions, some of them very severe. He had crammed the pressure on until the journal had been heated up to purple, but it did not seem to injure the bearing. He did oot think that a solid bearing, without lubricant, could be run with so low a coefficient of friction as one with lubricant, but the advantages of doing away with the necessity of oiled-bearings were so great that one could well afford some loss of power.

THE PNEUMATIC-TIRED SULKY.—The *American Machinist* says: Machinery men who have devoted their attention to the production of bicycles have, it seems, taught horsemen and builders of trotting sulkies something about wheels and tires, the new pneumatic-tired trotting sulky, which, by the way, is the production of our friend, Stirling Elliott, of Newton, Mass., having demonstrated its ability to enable the trotting horse to lower the record by several seconds. The reasons for this seem to be that the steel-tired sulky cuts into the surface of the track to some extent at least, and the substance of which the track is composed not being elastic, the force expended in compressing it at the point of contact in front of a vertical line drawn from the axle is not returned to the wheel at the rear of this line, while with the pneumatic tire the area of contact is, by the flattening of the tire, very much enlarged; the track is not scored, and the force expended in compressing the air in front of the vertical line spoken of is returned by its expansion at the rear portion of the area of contact. Solid rubber is commonly considered to be an example of almost perfect elasticity, but where the element of time enters, and it is necessary that the reaction in order to be of service should take place instantly, air is much better, as the pneumatic tires demonstrate. Ball bearings are also used on these sulkies, by which the axle friction is reduced to an almost infinitesimal quantity.

An American Automatic Tinning Machine.

Mr. J. B. Myers, who is connected with a firm of tinplate manufacturers, of Philadelphia, in a recent interview, said: "We have in use an automatic tinning machine, of American manufacture, which enables us to turn out roofing-plate 50 per cent. superior in quality to any ever manufactured in England or Wales. Our iron is manufactured by the Apollo Iron Co. This iron, which is in sheets, is fed into the machine. It is carried into a box containing two rotary brushes, which scour off all the scales and other impurities on both sides. The sheet next passes into a spraying-box, where all adbering particles are washed off. It is then thoroughly dried by passing through a set of rolls. The oext set of feed-rolls carry the plate to the edger, a device for edging the separate sheets, and passing them on together in a continuous strip. After the continuous sheet passes through the flux-pot, it runs into the tinning-pot. Rising out of the pot, the sheet passes through palm oil. It is then carried upstairs by the machine, cut into strips of any desirable length, and stored in rolls. The tin-coating is well and evenly applied and the joint between the sheets is thoroughly soldered. Although the machine is now used in making terne-plate, it can be used equally well on bright plates, either in continuous strips or separate sheets. The average capacity of the machine is equivalent to 100 boxes of 20x28 sheets per day of ten hours. It enables us to turn out a better quality of tin than is made in Europe. Under the plan used in Europe, the iron plates are first pickled in acid in order to remove the impurities. The machine obviates this. Then again the plates are more evenly tinned here. In Europe the plates are dipped and the coat is uneven, being much heavier at the bottom than at the top. Experts say that under the plan in vogue in England and Wales, it is impossible to put more than 40 pounds of tin in a box of plates 20x28 inches. Under our process we can put in any amount of tin, up to 100 pounds, if necessary."

Plumbing Practice.

Great care is taken by many plumbers in the adjustment of plumbing apparatus in that the work shall look symmetrical and mechanical in finish. This is proper and desirable, and should be insisted upon, says the *Operative Builder*. It is often the case, however, that an excellent piece of work in appearance is not as complete in utility as it might have been had a little more pains been taken with a feature of the work often neglected. Why it is that a plumber will run a certain supply pipe to a point of delivery and then throttle it by a flat waterway bibbcock and a flat waterway stopcock is to some minds inconceivable. If it be intended, then there is no further use of writing about it. Still it would be quite as reasonable to have the cross-section of the diameter of the pipe equal in area to the area of the stopcock or bibbcock, and the additional cost of the increased size of the pipe could then be avoided. This condition of things is frequently found in plumbing practice; it does not interfere so seriously in the matter of the size of the discharge faucet, the excuse being, the larger the pipe the greater the velocity than in a small pipe. Yet, losing sight of the fact that if such be the case, why not continue the same "to the end" of the faucet and get the benefit of the velocity entire? The serious part, however, in the plan is the stopcock controlling the supply to the delivery pipe and discharge cock. Very few plumbers consider what detriment is effected in using a flat waterway stopcock supposed to equal in cross-section of area the cross-section of the area of the delivery pipe with which it is connected. A few minutes' consideration will convince the most obtuse plumber that the ½-inch and ⅝-inch stopcock with a flat waterway in but few instances possesses the area in cross-section equal to ½-inch or ⅝-inch pipe, circular in form. Even if it did, it will be found that diverting a circular stream to a rectangular stream through the waterway of a stopcock and back again to a circular stream is at the expense of the energy of the velocity of the current of water occasioned by the diversion.

It is but trifling to maintain the relations necessary to reduce friction in moving water through service pipes. To break the current generated by velocity is the thing to avoid, and if it is recognized in plumbing service, a good step in progressive plumbing will be inaugurated.

Therefore, if you would obtain the best results from circular discharge pipes, be they lead, iron or brass, see to it that stopcocks are round waterway, and also the same regarding bibbcocks. It will be found upon close examination of the merits of this feature of plumbing that a great saving will be effected in the matter of frictional resistances, which absorb so much of the energy of the flow of water through distributing pipes in the dwelling and warehouse.

Scientific Progress.

Self-Developing Plates.

It has been suggested that photographic sensitive films might be so associated with transparent soluble films containing developing material as that, while the primary action of the image-forming light would be absolutely unaffected, simple immersion of the exposed plate in a dish of pure water, or other solvent, would suffice to set up chemical interaction between the materials constituting the associated films, and would result in the development of the image. Thus, for instance, the sensitive surface of an ordinary plate might receive a preliminary coating of a gum or other transparent and soluble varnish. Over this might be laid a clear, soluble film, containing matter capable of effecting development. When dried, this film of developer might be itself gummed over, and then coated with a further soluble layer, containing such other chemical constituents as it might be desirable to have present, but, pending the occasion for development, sufficiently isolated to avoid the possibility of chemical reactions. It is unnecessary to enumerate the different media, as collodion, soluble silicate, etc., that have been considered by the inventor as supporting and isolating layers for the suspension of the developing agent in the manner described. Several cases in which, probably, the idea could be successfully carried out, will at once suggest themselves to the reader. But it would be another thing to say that the conveniency of such plates, having combined layers of sensitive and developing salts, would not be more than counterbalanced by the obvious disadvantages. Needless to add, the device could equally well be applied to the combination of toning or fixing salts with chloride and other printing papers. It would be a simple matter to apply the supplementary chemical layer at the back of the paper or glass support; and, in the case of transparent supports, it might, if suitably pigmented, be regarded as, at the same time, a backing preventive of halation. In short, we quote the suggestion as an interesting photographic curiosity.—Optician.

LOW TENSION STREET ARC LIGHTING.—The growing popularity of low tension multiple arc lighting must have impressed every one who has watched the tendencies of electric lighting. When we see local incandescent companies and electric railway companies running hundreds and hundreds of such lights on their regular circuits, it is plain that a new and important factor in street lighting must be taken into account. As a matter of fact, a great many of these constant potential arc lamps are used on the streets, but it is still a novel thing that they should be used from end to end of an important thoroughfare. This departure has been taken, however, in the contract made last week by the New York City Gas Commission with the local Edison Company, for the lighting of Fifth avenue from Washington Square all the way to Fifty-ninth street. The lights will be in pairs at street intersections, and, of course, will be supplied from the Edison underground mains without the necessity of any overhead wires. A brilliant illumination of this fine avenue is expected in place of the feeble flicker of the old gas lamps, and the experiment will be very closely watched. The influence of its success upon the lighting of leading thoroughfares in large cities must be obvious to all.—Electrical Engineer.

THE MOON AND THE BAROMETER.—The influence of the moon on the barometer is dealt with by Mr. Bornstein in a recent article in the *Meteorologische Zeitschrift*. He refers to the question as to whether there exists any relation between the pressure of the atmosphere and the altitude of the moon. This study is based upon observations made at four different stations in Germany and Austria and does not take into account the phases of the moon, or her distance from the earth, but considers merely the lunar day. The results obtained are: First, that the variations of pressure do not indicate any atmospheric tides, and second, that at three of the stations the pressure shows but one oscillation during the lunar day. At Berlin and at Hamburg the maximum takes place a little before the moon sets, and at Vienna, at the moment of least culmination, whereas the minimum takes place, at all the stations, at the moment of the moon's rising.

An Automatic Telephone Exchange.

A very ingenious piece of apparatus, intended as a substitute for the telephone girl, is described in the *Electrical World*. It is not a new type of telephone, but merely an adjunct to the ordinary Bell transmitter and receiver by which any subscriber can place himself in connection with any other subscriber with whom he wishes to converse merely by the operation of a set of simple keys placed upon the telephone box at the subscriber's end of the line. It is not an easy matter to tell just how extended an application apparatus of this kind may find, but there are doubtless many places in which its application to existing telephone plants would prove economical. This is especially true of such places as large factories where the heads of different departments, who must communicate frequently with each other, are located in detached buildings, and also in small towns where the number of subscribers does not exceed a few hundred. Although there is nothing in the construction of the instrument itself to prevent its application to exchanges having several thousand subscribers, the multiplicity of contacts in such cases would doubtless be considered an objection to its use, although this could probably be satisfactorily arranged. Another point which might be raised against it would be the difficulty or complication made necessary in arranging to connect with the various lines of long-distance telephone service. It is of interest in this connection to notice that according to the statistics of the telephone industry, recently published by Mr. Allen R. Foote, for the decade preceding 1890, that the average number of telephone subscribers per exchange in the United States was 183, while the average number of employes per exchange was seven, or, in other words, the average number of subscribers per employe was 26. The average daily calls per subscriber are shown by the same statistics to vary from 48 in exchanges of 100 or less subscribers to 89 in exchanges of 1500 subscribers or over. Taking seven as an average in all the exchanges, this would indicate that one employe is necessary for every 175 calls per day. The Strowger apparatus will doubtless find a wide application in many places where the present high telephone tariffs have prevented the introduction of any telephone system, since we may look for the establishment of exchanges within the next two years in towns that average a very much smaller population than even the smallest towns where telephone exchanges are now in use.

A POLARIZATION EXPERIMENT.—At a recent meeting of the Physical Society of Berlin, Herr Arons described the following experiment on electrolytic polarization. If we divide an electrolytic vessel with platinum electrodes and acidulated water solution by a partition of some precious metal, such as gold, silver or platinum, a diminution of current is usually observed, and the metallic partition will be hydrogen polarized on one surface and oxygen polarized on the other. Herr Arons experimented with a view to seeing whether he could obtain a thin enough partition for the two polarizations to annul one another. He employed for this purpose an electrolytic vessel 22 cms. long by 5 broad and 8 high, divided in the middle by a sheet of glass pierced by a hole 1.5 cm. in diameter. When the sheet of glass with an unobstructed opening was replaced by one which had the opening covered by a piece of platinum foil 0.1 mm. thick, the deflection of the galvanometer was diminished, and there was a violent ebullition of gas. Gold and silver leaf partitions caused no disturbance. By altering the resistance out of the galvanometer circuit, its deflection was in each experiment brought back to its original value. The following figures give the resistance which it was found necessary to take out of circuit in each case: Solid platinum plates, 19 ohms.; platinum plate pierced with a hole 3 mm. in diameter, 5 ohms.; silver and gold (leaf), 0 ohm.; four layers of gold leaf superposed 0.25 ohm.

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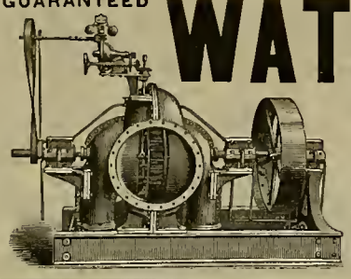

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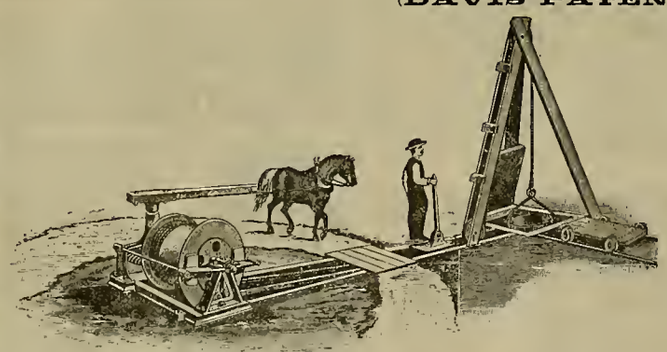

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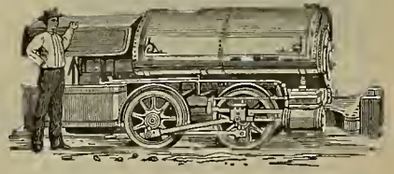

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Electricity.

Testing Dynamos.

Electric business generally is done in a most unbusinesslike way. A purchaser orders of a manufacturer a dynamo of a desired capacity; the purchaser gets the machine into position, puts the belt on, turns the switch and off she goes—that is, if she goes at all. If the dynamo does not start off immediately and bring all the lamps and everything else in the circuit up to the expected point of excellence, or if, for some simple cause, the dynamo doesn't "generate," it is at once condemned. The cause of the trouble may be an open circuit, or it may be the connections are not made correctly.

There are a great number of reasons why a dynamo will not always start up at once, and all of these reasons should be looked into before judgment is passed. I have seen engineers spend weeks to find the "pound" in their engine, and they did not "dam" the man that made the engine because it pounded. An engineer knows that there is a reason for it, and sets to work systematically to find the cause. But let a dynamo get out of order, and this same man will lose his head at once. I once went 150 miles to put a brush down on the commutator of a dynamo. An engineer of a certain plant in a large establishment in a sister city had been running a 1200 light incandescent light for more than a year. Finally, when he started up one night, one of his dynamos would not "generate." He had "looked everywhere for the trouble," and gave it up. I was sent for, and in a few moments, by a little systematic testing, discovered that the upper brushes did not touch the commutator by a small fraction of an inch. The stem on which the brushes were mounted had become slightly loose and had turned back enough to lift the brushes from contact with the commutator. The brush-holders were of the kind having a limiting stop each way. The remedy was, of course, very simple. The trouble could have easily been found by the engineer had he used a little "horse sense," and, as I have before said, a little systematic testing. I do not mean by this a series of guesses, but tests based upon sound judgment. Go off in a corner and think it out, but do not hop around and try a dozen different things without knowing the reason why you are doing them. It is seldom that trouble of this kind is cured accidentally.

I went to Milwaukee one time to find the trouble with a large Brush arc machine. The dynamo man said he had not been able to find the trouble, and that it had not worked for three days. It seems incredible when I relate the cause to have been that one section of the commutator had been removed and was missing. How the man in charge could have failed to discover it is more than I can understand, but he was ignorant of the fact until I pointed it out. If I thought that it would make interesting reading, I could relate, I venture, at least one hundred as ridiculous cases as these, where a little thinking and a general knowledge of the machines in charge could have saved time and money to the owners. I will not attempt in this article to describe how these tests should be made in order to locate trouble, for there are hardly any two cases alike. It will therefore be necessary to adopt a systematic method, which I will endeavor to present at another time. There are two sides to every story, and the engineer and dynamo men are not always to blame. The owners of plants should not look to them for all the trouble that occurs until they have first performed all they should before the plant is given into their hands.

Every plant that is put in should be tested, "received" and accepted by an independent and competent electrical engineer, one who is in business for himself and expects to remain so, so that he could give a fearless and honest opinion to his employer. He should closely examine the dynamo for capacity, insulation, continuous run, efficiency, and an important and often overlooked quality, mechanical construction; and then come in a number of minor features which should be looked after, inductive velocity of the armature—it may be greater on a drum than a ring armature; rise of temperature on a full load should receive close attention; hysteresis and Foucault currents are much more noticeable in badly constructed and proportioned machines than is usually suspected. I have known a case where these two ever present evils have absorbed more than 10 cer cent of the power for the dynamo. The heating of switch contacts and other joints should be noted, the resistance of the circuit as a whole, and in sections, should be measured. In fact, every condition should be carefully noted. If the dynamos are compounded, see that the rise with load corresponds with the loss in line, also be careful to note if there is more than one compound dynamo, whether the equalizer is large enough. The resistance of the equalizer should not be less than one-half of the resistance of the larger armature.

There are numberless points of this kind that should be carefully inspected by a competent man before a plant should be accepted, and I believe that if owners understood more of the importance of these seemingly little points—but, in fact, very important factors to the success and economical maintenance of every plant—that there would not be so many butchers in the business of manufacturing electric-light apparatus to-day.—Foree Bain in Electrical Industries.

Conduit Roads.

Although it will probably be difficult to find a more economical system of electric railroading than the overhead trolley, yet there are many cases in which objections are made to the poles and overhead wires necessitated by this system. In such places, as shown in the cities of New York and Chicago, cable roads are rapidly replacing horse lines, and are therefore encroaching on a field which might have been claimed by electrical traction if there had been a few conduit or storage battery roads in successful operation in this country, which overcome these objections to poles and wires. The unquestionable success of the overhead trolley roads and the lower cost of construction and operation seem to have checked the development of otber systems. This is greatly to be regretted. There is a field for both. The overhead trolley will doubtless obtain the lion's share of the business, but there are plenty of street railways in large cities where the overhead wires are not allowed, and where some other system must be used. If there is no electrical system which is better than the cable, this part of the railway business will be monopolized by the latter. The recent introduction of miles of cable road in New York and Chicago has already shown this. There are two electric conduit roads at present running regularly, a long one in Buda-Pesth and a short one in Chicago, both pronounced by impartial parties to he a success. With these two as a beginning, something ought to be accomplished in the field, and it is not unlikely that the first introduction on a large scale will be made in Chicago. It is rumored that the success of the latter road was one of the reasons why the overhead trolley ordinances in Philadelphia were vetoed by the mayor. The parties who asked for overhead privileges in that city, it is said, tried to have President Yerkes pronounce the Chicago conduit system a failure, but he refused to do so, and, on the contrary, stated that it gives perfect satisfaction, on hearing which the mayor vetoed the Philadelphia ordinance. It is to be regretted that the influence of capitalists should he made use of in this way to attempt to undo that which engineers have finally accomplished after years of hard and patient work, in cvercoming not only engineering difficulties but also deep-seated prejudices.—Electrical World.

A PROPOSED UNDERGROUND ELECTRIC RAILWAY FOR BERLIN.—In a German contemporary, Mr. Holle describes a scheme for an electric railway in Berlin similar in many respects to the City & South London line. The proposed plans were made by the Allegemeine Elektricitats Gesellschaft of that city. It is proposed to run the trains at three-minute intervals a little over half a mile apart; there are to be 48 trains each with its own locomotive, and 144 carriages, running at one time. Two power stations will be erected, each one having two separate, complete plants; the connections of the generating stations with the different parts of the line are to be made as flexible as possible, that is to say, to provide power all along the line in the event of a breakdown in the machinery for any one section. Five hundred volts will he used; the motors will be slow speed, with gearing running in oil. The length of the line is given as about 30 miles and is to cost about $10,000,000. The fare is to be 2½ cents for any distance. It is estimated that the traffic will he about five persons per car mile.

THE Havemeyer building, which is claimed to he the handsomest office building now heing erected in New York city, is going to he equipped electrically in the most perfect manner. It will have an installation of over 3000 incandescent lamps. The wiring will be done in interior conduit throughout, and the generating plant will be of the most modern type, the dynamos heing directly coupled upon the shaft of the engine.

Electrical Cars in City Streets.

There is always a certain proportion of the people in every community who find it next to impossible to look at anything whatever from any new standpoint. Roads and streets have been for a long time built and maintained for the use of those who traveled by the aid of horses, and from this circumstance there are very many well-meaning people who cannot bring themselves to think that any otber use of them should be allowed, especially if such use is at all liable to "scare" a fractious or uncontrollahle horse, and no matter how many people may desire to travel upon them by other means.

Comparatively few people living in cities can afford to maintain their own carriages and horses. If they travel about at all it must be on foot or hy some comparatively cbeap method of locomotion—maybe an electric car or a bicycle. But it seems that too many carriage owners imagine that no such use of streets should be allowed, though it is, of course, in the direct line of the employment of labor-saving machinery and of the greatest good to the greatest number.

A line of electric cars was recently started in Plainfield, N. J., in the face of very determined and, for years, successful opposition of carriage-owners. One of the cars recently frightened a horse and caused a runaway, with a result, as stated, that a "test suit for damages is to he instituted." Such a suit would probably be based upon the assumption that no use of a street is legitimate that may frighten a horse, no matter if such use accommodates a hundred times as many people as are able to ride in carriages.

The bicyclists have had to fight this notlon from the first, and have finally, by means of a powerful organization, established by numerous court decisions their right to the use of the highways upon the same terms as people who travel in wagons and carriages, and that drivers of horses are themselves responsible when they drive animals that cannot be controlled.

It seems altogether probable that the use of machinery of one kind and another for moving about on streets and highways will increase rather than diminish, and that the idiosyncrasies of the horse, or his individual preferences for flying pieces of paper, umbrellas and barking dogs as objects of alarm, will not be allowed to permanently obstruct this progress.—American Machinist.

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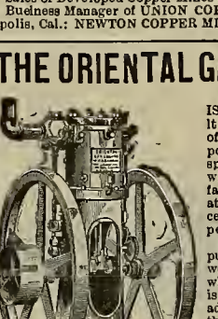

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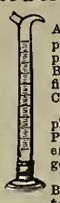

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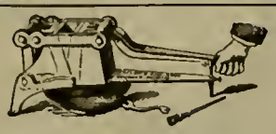
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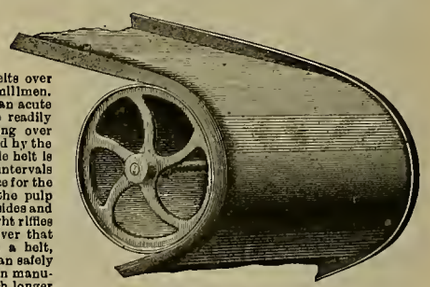
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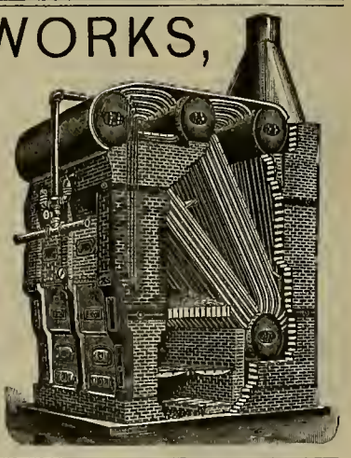
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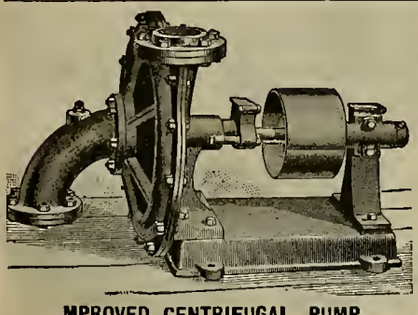
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Useful Information.

A New Miner's Electric Lamp.

The desirability of superseding in collieries the ordinary miner's safety oil lamp by an electric lamp, which becomes extinguished the instant the light is exposed to the naked air, says *Iron*, has led to numerous endeavours to adapt electricity to this purpose. Secondary or storage batteries have been for the most part employed, although attempts have been made to press primary batteries into the service. The latest attempt in this connection is that of Colonel Engledue, late R. E., of Byfleet, Surrey, who appears to have eliminated from his lamp all the objections to which previous lamps of this nature have for the most part been open. These are—excessive first cost and heavy cost of maintenance as compared with oil lamps; inability to burn the necessary number of hours; great weight, and the necessity for skilled labour to adjust them. The Engledue battery is of very simple construction, consisting of a wooden case 6½ inches by 5 inches by 3 inches, having a partition forming two cells. These cells are lined with lead, to which are attached four carbon plates in each, thus bringing the carbon and lead into electrical circuit. The top of the battery is hermetically sealed by an indiarubber washer, over which an ebonite cover is tightly screwed into the wooden case. Two ebonite plugs are screwed into and through the ebonite cover, each of which holds a cylindrical zinc element, all being made tight by rubber washers to prevent leakage when the battery is reversed. Contacts with a glow lamp are made in the usual manner, the lamp being protected by a small lantern with a reflector. The battery is charged to within about an inch of its top with Colonel Engledue's electrolytic fluid, and after working for four hours, when a proportion of the zinc and also the strength of fluid is somewhat exhausted, the battery is reversed. The increased area of the hitherto-untouched zinc is thus attacked by the somewhat weakened solution, and the electro-motive force of the battery is sufficiently sustained for a further period of six hours, making a total of ten hours' working. In order that the battery shall swing properly when its center of gravity has been altered by reversal, a simple and effective handle is used. The lamp has been tested in practice, and is found to give a useful light for from 10 to 12 hours, and to be otherwise efficient and suited for its purpose. It weighs about five pounds, and its first cost is put at 15s., the cost of maintenance being put at 6d. per week, which is about the same as the ordinary miner's lamp. Altogether the new lamp appears to embody the elements of success.

JAPANESE METALWORKERS.—The Japanese are pastmasters in the treatment of alloys, both in texture and color, and no better guides exist. They achieve their grandest results by the simplest means, a judicious blending of various metals, inlaying and pickling. Copper is the basis of their chief alloys, and by incorporating with it certain proportions of gold and silver they obtain remarkable results in color through the pickling process. Not only do they get striking effects from their alloys and pickling, but their mode of working up the metals is a thing to be studied. For instance, they will take six or seven plates of different metals and alloys, weld them together, and then by drilling, punching-up and filling, get a surface in which all the metals show in a manner that is truly wonderful. By the range of tints at their command they can work out on a metal surface scenes of life and landscapes with effect never dreamed of by metalworkers in the Western world. Among some examples recently shown in England was a knifehandle on which was a representation of a duck dipping its head under water of a stream in which it was swimming, the arrangement of the different alloys by which it was composed and the pickling being so well-arranged that the neck of the duck was seen as under the water when the handle was held in a certain light. Another example was a swordhilt on which some minnows, not more than one-sixteenth of an inch in length, and each having a pair of golden eyes, were swimming up a stream, the effect of their being below the surface of the water being suggested with marvelous skill.

FINISHING REDWOOD.—In order to properly educate the Easterner in the proper way to finish redwood the following method—which is a satisfactory one—is published. It gives a hardness and lasting polish. It is as follows: For the first application use one part of boiled linseed oil to five parts of benzine or turpentine. This gives a rich dark color without staining, and by exposure to the sunlight a varied color is obtained, the softer part or end wood turning dark, the other remaining light. The wood should then be treated with two or more coats of shellac and well sandpapered; then apply varnish or hard oil as required, after which, if well rubbed with pumicestone, a highly polished surface is obtained. Where a light, cheerful finish is required use only white shellac for filler, and shellac, hard oil or varnish for outside coat, hard oil being preferable, as it gives a greater protection to the wood.—West Coast Lumberman.

INDUSTRIAL PROGRESS IN THE SOUTH.—Since 1881 the corn crop of the South has increased 75 per cent, as against 71 per cent in the rest of the country; the cotton crop has increased from five and a half million to nine million bales—an increase in value, even with the present low price, of $200,000,000; in 1891 there were nearly 45,000 miles of railroad in the South, against less than 24,000 in 1881—a gain of 87 per cent, as against a gain of 56 per cent in the rest of the country. The passenger traffic of the same roads increased during the same period 360 per cent, as against an increase in the rest of the country of only 168 per cent. In pig-iron manufacture the South's output jumped from 451,000 tons in 1881 to 1,914,000 in 1891—a gain of 323 per cent, as against a gain for the rest of the country of 78 per cent; in other words, in 1881 the North and West made more than nine times as much iron as the South; in 1891 they made less than four times as much. The increase in the number of milloperators in the South was 135 per cent, as against an increase in New England of 17 per cent. And so in every line of productive activity the marvelous rapidity of increase is explained, showing that in assessed valuations the property of the South has in this period very nearly doubled, and increased from $187 per capita to $271—a record that is probably without a parallel in the whole history of substantial industrial growth. And in spite of the temporary depression caused by an overproduction of cotton, the increase goes on.—Forum.

TRUE SURFACE PLATES.—When a set of surface plates is true, if their surface is thoroughly cleaned with a silk handkerchief or the palm of the hand, and one is applied to the other, it appears to float about as if on numerous frictionless rollers, the slightest touch being sufficient to move it. If one plate be slid on the other, applying sufficient pressure, they will be found to adhere together, the top one being able to hold up the bottom one with ease. This was at one time thought to be owing to atmospheric pressure, the plates being so true as to exclude the atmosphere. This, however, does not seem to be the case, for in a lecture before the Royal Institution, Dr. Tyndall describes some experiments he made with some hexagonal Whiteworth plates, in a vacuum, and they showed both the property of adhesion and floating. The lower plate of the two weighed three pounds, and had attached to it a mass of lead weighing ten pounds, but still the plates adhered together. Dr. Tyndall supposes the adhesion to be caused by the molecular attraction of the numerous bearing points brought into contact through the truth of the surface of the plates.—The Mechanical World, London.

DEEP COAL MINING IN EUROPE.—The upper seams of coal in the continent of Europe are being gradually worked out and it is found necessary already in many quarters to commence work at greater depths. The upper seams are mostly thin, but lower down the deposits are much thicker, so that the difficulties attending excavation at such great depths will be in some degree compensated. In the Mons district in Belgium some shafts have already been sunk to the depth of 3775 feet. Though the coal is excellent the hinderances to mining are tremendous. There are many formidable blows of gas, and water at 122° Fahr., enters the cuttings in great volumes. Some very powerful pumps are being put down in order to keep the workings clear of water. It has been found necessary to replace the ordinary wooden timbering with steel props.

COLOR blind and fire blind are not at all synonymous terms nor are the conditions similar. Color blindness is generally permanent; fire blindness only temporary. A person gazing intently at an open fire for some time may become fire blind for the time being, and thus be unable to judge of the degree of heat that is being taken on a piece of metal.—Sparks from the Crescent Anvil.

Sugar in Mortar.

Some time ago a statement that the mixture of a small quantity of sugar with mortar greatly improved the latter, exercised the risible faculty of the building fraternity. The notion was regarded as too ridiculous for serious consideration. There is, however, reason to believe that the addition of saccharine matter to mortar is an extremely valuable discovery. In the first place it enables bricklaying to be carried on in frosty weather.

About two pounds of coarse, brown sugar to a bushel of lime and two bushels of good sand, will supply the proportions for a mortar that will resist frost admirably. It is claimed, however, that in addition to this advantage, mortar with sugar mixed in it is vastly superior to mortar without it. It sets as hard as cement very soon, makes the brickwork extremely strong and quite effective when used with dry bricks. For indoor plastering also, saccharated mortar sets hard quickly. When portions of the same wall had been covered in one part with sugared and in another with unsugared mortar, the latter has ripped up directly when a nail was run over it. Months afterward, the other had become as hard as stone. Much interest is taken in the matter by Mr. Crampton, of Cranleigh, Baltimore, and he reports some interesting experiments. He points out that if sugar be added to mortar that is already made it will render it too thin. Strong, sugared water dissolves lime in the same way that water dissolves sugar. It is, therefore, necessary to dissolve the sugar in water first, and then add the sugared water to the lime slowly and cautiously. The mortar should be as stiff as it can be used. For lime-washing, one pound of sugar to 16 gallons of water will make it adhere splendidly. Drops of whitewash made with water so mixed, if they fall on the floor or wiodow, or any iron plate, cannot be washed off. They stick like enamel, and have to be scraped off. Evidently sugar is not such an absurd thing to mix with lime as the practical man thought.—Operative Builder.

AIR OF MINES.—A simple and effective method of examining mines, in respect to their prevalent atmosphere, has for some time past been employed at Kotschied, near Aachen, Germany, and is likely, from its results, to be extensively resorted to. A gasholder is placed in the chief ventilating shaft, and is so arranged that it becomes filled in 12 hours, in this way it being possible to obtain a fair average sample of the mine air. The air thus collected is examined by means of a grisometer, any free carbonic acid that may be present is absorbed by caustic soda, and its percentage estimated by noting the diminution in bulk. The marsh gas is then decomposed by a platinum wire heated to incandescence by means of an electric current. A further diminution in bulk takes place under this arrangement, and, the degree being noted, the percentage of marsh gas in the pit air can be calculated, and the necessary precautions be observed accordingly.

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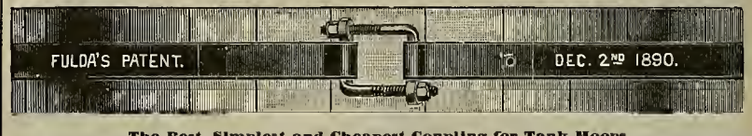

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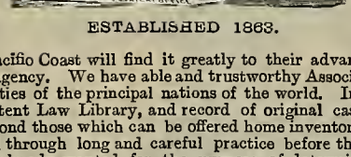

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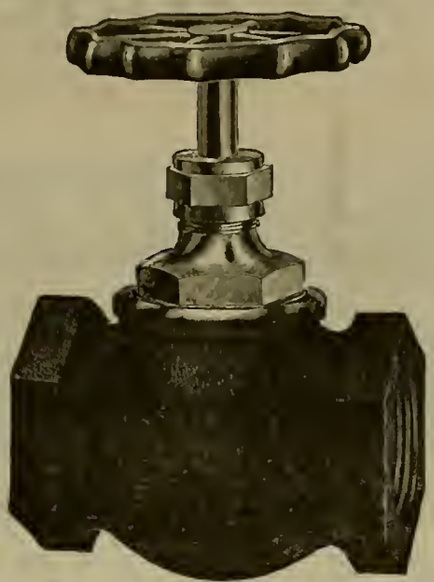

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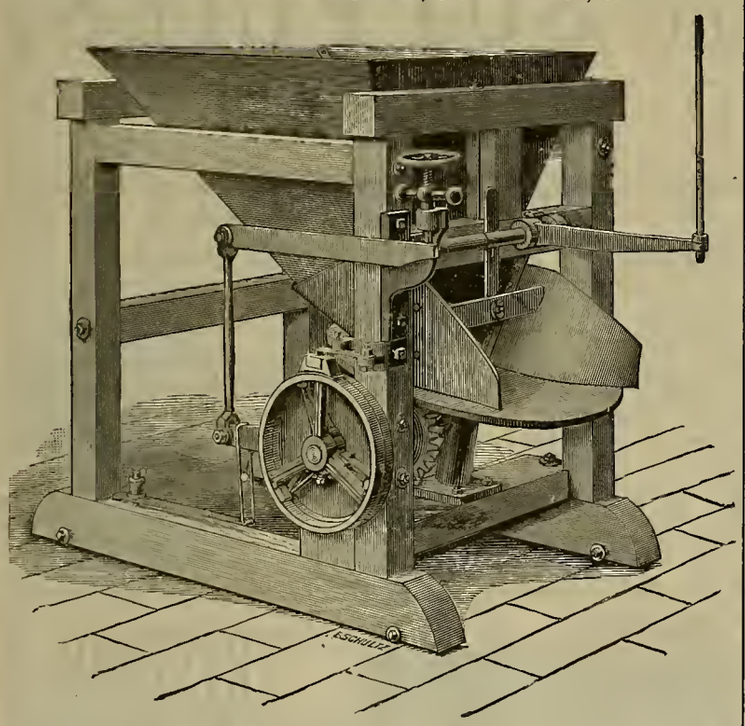

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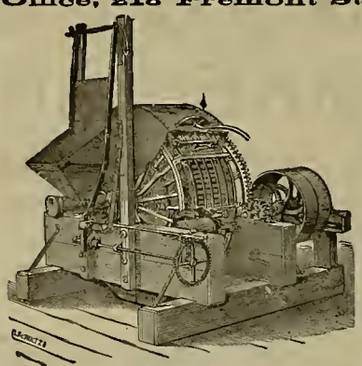

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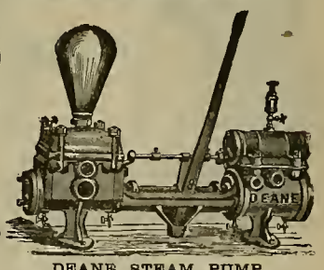

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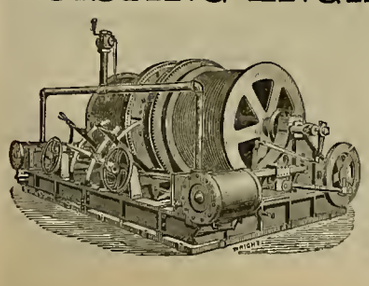

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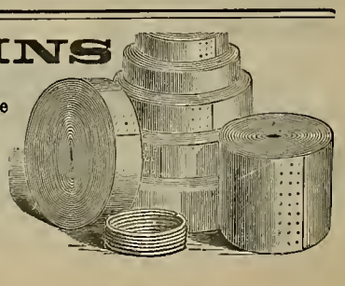

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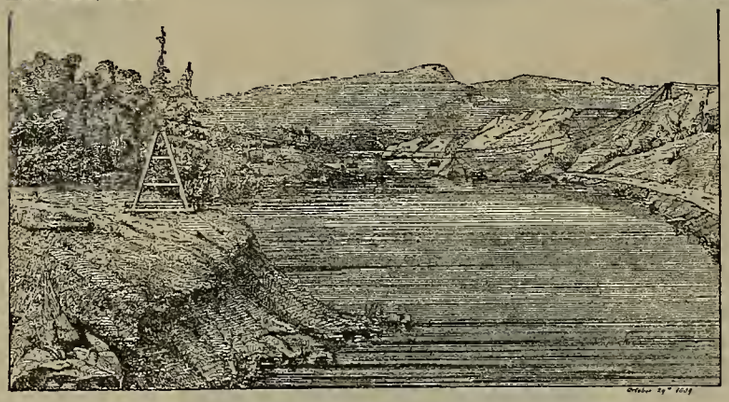

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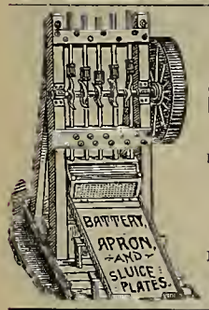

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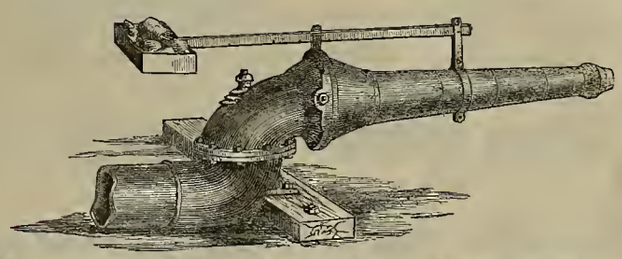

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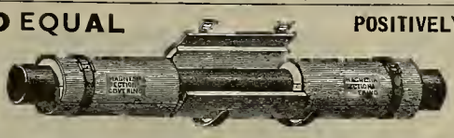

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

CLINTON.—*Record*, Sept. 23: Word comes from Wieland that at the Clinton mine the scarcity of water in the ditch has rendered it necessary to reduce the working force temporarily.

A BIG YIELD.—The Kennedy mine yielded $180,000 last year. Amador county gold mines are hard to beat.

NEARLY READY TO START.—The Hector 40-stamp mill will start up next week. Everything around the mine is being put in fine shape and when the mill is once started it is expected that it will run steadily.

AROUND PLYMOUTH.—A crushing of ore is being hauled from the Bay State mine to the Pacific mill at Plymouth. A fine body of ore has been encountered in the Wheeler mine, near the same place, and teams are now busily engaged in hauling the quartz to the Cosmopolitan mill for a test run.

WILDMAN.—Amador *Ledger*, Sept. 24: Last week a break happened to the main pipe at the Wildman mine on Broad street, bringing the machinery to a standstill. The underground men were all in the mine at the time of the accident, including Superintendent Tregloan. As it would take about a day to repair the break, all decided to climb out by the ladder way, rather than remain below. In a short time from the decision all were on the surface, Mr. Tregloan with the balance. The break is repaired in a good, substantial manner, and everything is running smoothly again.

Butte.

THE WHEELER MINE.—Oroville *Register*, Sept. 22: Wm. Wheelar of Wyman's ravine has unbounded faith in the famous blue lead that is attracting so much attention about Bangor, and is confident from the prospecting done years ago that this same lead stretches from Bangor clear to this town. He says that shafts have been sunk at various places, and that the same character of gravel has been found in a dozen spots. He determined last spring to demonstrate that the channel could be found and set to work sinking a shaft on his land. The work was abandoned for a time, for he was obliged to give his attention to the mine he owns at Brown's Hill, but he has lately been sinking, and is now down about 85 feet. Good gravel has been struck, and the bed is about four feet thick. The gold is coarse and heavy, but the gravel prospects well. He has let a contract for putting up two arrastres that will be run by an overshot wheel, which he will have built at once. The water will be obtained from the Palermo ditch, and as soon as the arrastres are completed, he will put a large force of men at work getting out gravel. He is confident that he has a bonanza, and his friends all hope his predictions may prove to be true.

MINING NOTES.—A Downieville company has been organized to open a mine between Bangor and Wyandotte. The shaft on the Banner mine is now down over 400 feet. It is a 6x10 shaft with a double compartment. It will be sunk to the 500-foot level before any crosscuts are run to strike the lode. The formation which has heretofore been dipping toward the mountain has now turned toward the river, and experienced miners believe this is a good indication. From the Hay & Clark mine at Bangor there has been taken up to last Saturday $6000 in gold-dust, while the total expenses have been about $5000, leaving $1000 net profit. The channel where this company is working is 400 feet wide and the gravel is 17 feet thick. The new quartzmill at Forbestown, erected by the owners of the Stow mine, is nearly ready for operations.

Calaveras.

ANOTHER MINING ENTERPRISE.—Mokelumne Hill *Chronicle*, Sept. 24: Mr. W. H. Curnow, of this place, and his brother-in-law, J. K. Dennis, of San Francisco, have started in on a new mining venture this week. They have commenced to sink a shaft on the channel that runs from what is known as the "Old Lone Star Diggings," in Happy valley, to Old Woman's gulch. The Lone Star claim, which was worked some 30 years ago, is situated at the head of the channel, and is said to have been exceedingly rich. Mr. Curnow intends to sink on the channel some 600 feet below the old Lone Star claim, using a horsepower whim to prospect with, and if developments should prove satisfactory, the necessary machinery will at once be erected to work the channel on an extensive scale. Mr. Curnow is of the opinion that it will take a shaft over 100 feet in depth to "bottom" the channel.

BONDED.—The Harrison and Victor mines on Esperanza creek, owned by Zumwalt and Vandell, have been bonded to E. H. Davison of this place for one year for $2000. The Herold Mining Company, a San Francisco corporation, have purchased the five-stamp mill on the Cleveland mine at Sandy Bar, and are now moving it to their mine on the Mokelumne river, near Big Bar. The mill will be running in about two weeks. A force of men is now at work on the Foote & Thompson mine at Rich gulch. The gravel mines located on John Williams' ranch in Old Woman's gulch have been bonded to Oakland parties. Work will be commenced at once.

Kern.

STRIKE OF RICH GOLD ORE.—Bakersfield *Californian*, Sept. 24: In 1858, A. J. Maltby, who for many years has lived at Woody, opened a gold mine lying in the ridge between White river and Rag gulch in Kern county, and from it extracted a great deal of gold. When water was struck, the ground was stoped above and then work ceased. Mr. Maltby, however, always felt confident that there was an abundance of rich rock still deeper down in the vein, and recently, with other parties, started a shaft and tunnel to tap the mine below the old workings. The pay chute is found to be about 60 feet long with a vein from 5 to 21 inches wide and at present carrying a seam of rich ore about 5 inches thick that will mill over $300 a ton in gold. Mr. Maltby has brought samples of the quartz here and left them at J. S. Drury's, where they may be seen for a few days. The quartz is lively and carries seams of oxide of iron which are literally full of gold. The specimens are very handsome, and withal are of good size. The ground from the tunnel to the old works has been stoped out, the last run of 38 tons yielding 221 ounces of gold bullion valued at $2762, or over $73 per ton. In this run there was no assorting, all of the quartz that was mined being sent to mill. In the bottom of the tunnel the ledge continues as good as above, the rich seam especially well holding its own. There seems to be no reason why this mine should not yield a handsome profit.

Mariposa.

RENEWED INTEREST.—Mariposa *Gazette*, Sept. 24: We are pleased to be able to state with authority that considerable interest is being shown just now in mines in Mariposa county in the Sherlocks and Whitlocks region, especially, more hopeful signs are being developed this fall than has existed there for years. The Helm brothers have been working faithfully for several winters on a claim on Whitlocks. It has been slow work, for it takes money to develop mines, but they had a good prospect and they have followed it until they are down 100 feet, and a cleanup of 12 tons of rock a few days ago gave such satisfactory results that they are sure of big pay as long as they continue on that vein. The San Rafael and Ellingham mines have lately been bonded by new men and active steps are being taken toward enlarged forces in both mines, and should the outlook justify it, the stamps of a big mill will before long awaken echoes on the Colorado hills. The Ward brothers have increased the working force on the Whitlock mine and are preparing for a steady season's work. They have already enough good-paying rock in sight to insure the success of a mill. Besides these mines, the usual number of prospectors are looking around selecting desirable locations before the coming winter. In the neighborhood of Bear valley several mines are being worked quietly but successfully. The prayers of all residents of the county will steadily ascend for a continuation of the same blessing.

Nevada.

THE OAK TREE MINE.—Grass Valley *Tidings*, Sept. 23: This morning steam was again turned on at the Oak Tree mine adjoining the Peabody. Since the last crushing, a few weeks ago, the mine has been lying idle, while arrangements were being made to prosecute more vigorous development work. This mine has been in operation but a little over a year, but from present indications it is certainly an unusually promising property. The first crushing of ore from the ledge, which is ten inches in thickness, yielded $1240 for 19 loads. The second crushing, containing the same amount of quartz, yielded $871.25. The shaft is but 100 feet in depth, but sinking will be resumed and no stoping will be done until the shaft is sunk 100 feet deeper. But six men will be employed until the 200-foot level is run, when a large force of men will no doubt be employed.

MERRIMAC MINE.—Grass Valley *Telegraph*, Sept. 24: Everything is going on in a satisfactory way at the Merrimac mine. Chas. Stocks, the superintendent, informs us that the shaft is now 530 feet in depth and the ledge looks well. The ledge in the bottom is about 15 inches in thickness. The company contemplates starting a station at the depth of 500 feet, and will then drift east and west. The company has now about 100 tons of ore on the dump. The mine is situated on the western slope of the Town Talk ridge, and is in the Grass Valley zone of quartz ledges. The formation is in slate. The company is negotiating for electric power, and in the meantime the shaft is being constantly lowered. The ground is easy, the miners making about 60 feet a month.

HERMOSA MINE.—Grass Valley *Telegraph*, Sept. 26: Saturday afternoon quite a good-looking ledge was found in the south drift at the 100 level in the Hermosa mine. Just what size the ledge is will be determined in about one week. The owners of the mine feel quite jubilant over the new find.

Plumas.

GREEN MOUNTAIN.—National *Bulletin*, Sept. 24: From W. N. Goodwin, who was at the Green Mountain mine last Saturday, we learn that a good-sized body of rich ore has been developed in the face of No. 6 tunnel—good $15 rock. The mine generally is looking well, the timbering and other improvements being of a substantial character.

Siskiyou.

QUARTZ AND OAVEL.—Yreka *Journal*. Sept. 28: The work of developing the old Clark & Co. ledge on Humbug creek, recently purchased by a San Francisco company, still continues to yield rich-looking quartz, with the vein widening as the shaft is extended deeper on the ledge. The company will be ready to crush in a few days, as the old Warren mill, taken some time ago from Yreka Flats, is almost ready for starting up again at this claim, under the supervision of Mr. Hunt. At the Spencer, Boyle and other mines on the same creek, a large quantity of quartz has been lately taken out, with new finds in the way of extensions, to keep the mills in constant operation, while a great amount of placer-mining is carried on with good success, to make Humbug one of the most prosperous mining camps in Siskiyou. The Golden Gate Co., now running a tunnel into the Humbug mountain directly west of Yreka, continues operations steadily, reaching a distance of 180 feet, with the water supply gradually increasing. No gold-paying quartz or gravel has yet been found, of much value, nor do they anticipate any for some distance yet. The Lee, Lash & Co. blue gravel claim at Greenhorn creek, south of Yreka, near the stage-road, is to be reopened soon, now that the bedrock water has diminished to such an extent that the steam pump can handle it easier in the way of pumping to keep the bedrock clear for drifting. The Spencer Mining & Milling Co. of Portland mining men, working a two-foot ledge on Booker creek in the Bailey Hill section, just this side of the Oregon line, realized about 14 ounces of gold in a couple of hours crushing last week with a two-stamp mill. The mill consists of machinery worked like a Burleigh drill, with a lot of pipe and no boiler, by means of which the stamps are operated—an invention of Mr. Spencer, the principal owner of the mine.

Shasta.

THE OLD BANGHART.—Redding *Free Press*, Sept. 24: It has been some years since Mr. Banghart left Whiskytown with a snug little fortune taken from the Banghart mine. The mine was sold to a San Francisco company and the company sold it to other parties; in fact, it changed hands several times, finally becoming the property of Dr. George Grotefend, who sold a half interest to James Eligh. The mine is a peculiar one, there apparently being no regular ledge, but a series of ledges crossing and recrossing each other. Four thousand feet of tunnels have been run, and sometimes for several months dead work must be done before any gold appears, when suddenly cross-ledges are discovered and more or less gold is extracted. Grotefeud & Eligh performed dead work for a month, when they encountered decomposed quartz and gold. Five hundred dollars a day has been the average yield for a week past, and it it is thought that $10,000 will have been extracted before the pay chute runs out. Grotefund has every confidence in the mine, but says it is one of that kind of properties that cannot be sold for its real value.

NOTES.—The cyanide process is a big success at the Shasta mill. E. P. Connor says that his mine still continues rich and that the walls of his shaft are well defined. Vandeveer was down from Flat creek Thursday. He is getting out ore, but will not crush until fall rains furnish water. Several miners in the vicinity of Shasta are working their mines and doing well by selling their ore to the Shasta Gold Extraction Company. The Calumet Company expect to have their ore cable ready for operation within the next 30 days. This cable, when completed, will have a working capacity of 50 tons a day. Gus Dannenbrink passed through here on his way to Weaver and reported everything flourishing on Knownothing. He thinks the new process of working base ores a success. The Calumet Company are actively at work opening their mines on Flat creek. They are also pushing down their shaft at the Calumet mine with the view of being able soon to furnish their cyanide works with an abundance of ore. The Lower Springs mining district was one of the richest in placers during pioneer days, and thousands of dollars were washed out of the soil. These placers were fed from quartz veins, and thousands will be yet extracted from pockets and seams. For pocket hunters it is a fruitful field.

Sierra.

WORKMAN QUIT WORK.—*Mt. Messenger*, Sept. 24: Last Saturday evening, the workmen employed by the Bald Mountain Extension Company quit work. The trouble was in regard to wages, as we understand the situation. The company has heretofore been paying $3 a day and charging 80 cents a day for board and lodging. Recently the management decided to hereafter pay its workmen $50 a month and board them. To those who had families, and who went home Saturday night and stayed over Sunday, a rebate of $2 a month was made. This has been customary since the works were opened at the new tunnel. The men were not satisfied with these wages, and, not being able to make any other terms with the company, they quit work. We are informed that orders have been given to pay off the men and close the works. Only a few men are now at the mine. No work will be done in the drifts for the present, and probably not until next spring. The two tunnels that were being run will be let by contract. It is to be regretted that any disagreement should exist between the company and the men, as it can but be a detriment to both parties.

Sonoma.

CINNABAR.—Sonoma *Tribune*, Sept. 22: After several months' prospecting at the Crystal mine in the Pina Flat cinnabar belt, a development was made last Saturday that infuse more interest and encouragement in the owners. A rich body of ore was struck and its depth is immeasurable. The company proposes putting up a furnace and smelter in a few months and then operations with increased forces will commence in earnest.

Yuba.

MOONEY FLAT AND SMARTSVILLE NOTES. Wheatland *Four Corners*, Sept. 24: While the wave of depression has fallen with a heavy hand upon some of our sister mountain towns occupying higher latitudes, owing to their inability to work the mines by hydraulic process, the people of Mooney Flat are showing a spirit of healthy activity, push and business enterprise along the line of drift mining, not to be surpassed by any other town of its size in the State. The Smartsville mine, managed by John Doubt, cleaned up last week from 180 cars, $400. There are 16 men employed at present. We are not, at the present time, taking out any great amount of money, owing to the tearing down, removing, putting up the mill, sinking shafts and running gangways. This, of course, has entailed quite an expense upon a company of ten, who are all workingmen, and who have no great amount of reserve capital to draw upon. This work has occupied about three months, and will probably consume another month before the arrastres will be running up to their full capacity. It is estimated that the entire expense will be somewhere in the neighborhood of $5.00, providing the channel containing pay dirt is reached by the Ayer Company within the period stated, and the prospect looks very flattering. If the opinion of mining men is worth anything, there is certainly a very rich and extensive mine in this locality.

NEVADA.

Washoe District.

CONS. CAL. & VIRGINIA.—*Chronicle*, Sept. 24: 1750 level—Have continued to extract some milling ore in working upward from the sill floor to east crosscuts Nos. 1, 3 and 5 from the main south drift, and from the point where the upraise from the end of the drift run south from the end of the crosscut run west from the end of the main southwest drift connects with the 9th floor openings. The upraise started in the crosscut run east from the end of the south drift last mentioned has been carried up 14 feet; total length 37 feet; in ore of milling value. Have continued making repairs to the southwest drift. 1800 level—Along the south end of the drift running south from the crosscut run east from the winze No. 1 sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. In stoping upward from the drift run south from the crosscut run east from the bottom of winze No. 2, down 45 feet, have extracted some milling ore. There has been extracted from all parts of the mine during the week 992 1200-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $26.78 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $24.01 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $15,927.87.

OPHIR.—1465 level: From the south drift, 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, the west crosscut No. 2 has been advanced 16 feet; total length, 101 feet; in porphyry and clay carrying a little quartz of nominal value.

MEXICAN.—On the 1465 level, the west crosscut, which was started from the drift run north from the crosscut run west from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, has been advanced 11 feet; total length, 93 feet, continuing in porphyry and clay.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift has been extended during the week 18 feet; total length west from the joint shaft, 2457 feet. The face is in porphyry.

UTAH.—The north drift from west crosscut No. 2 has been extended 19 feet; total length 38 feet. This drift is passing through a porphyry, quartz and clay formation.

SIERRA NEVADA.—The work of enlarging and lowering tha Cedar Hill drift has been continued up to the vein on which we have drifted six feet, from which some pay ore has been saved; face shows 3½ feet of quartz assaying from $17 to $20 per ton. We have broken ground for an intermediate tunnel midway between the Kenosha tunnel and the Cedar Hill drift.

ANNEX.—East crosscut north on 420 level was advanced during the week 20 feet; formation clay and porphyry.

GOULD & CURRY.—We are doing considerable repairing on the 200 and 300 levels. On the Sutro tunnel level, the joint north drift with Savage Company had been advanced 26 feet through hard porphyry; total length, 566 feet.

BEST & BELCHER.—At a point in north drift, 143 feet from east crosscut, started east crosscut No. 2 and extended same 14 feet through porphyry and stringers of quartz.

HALE & NORCROSS.—1800 level: During the week advanced the north drift 15 feet; total length, 210 feet; face in porphyry. The drain in this drift has been completed to the face. We have started two west crosscuts from the north drift.

CHOLLAR.—Are repairing north drifts on the 750 and 850 levels. The east crosscut, 160 feet south of north line, 930 level, is in 83 feet; face in soft porphyry.

POTOSI.—Repairs to drift connecting with Lindsey winze, 250 level, are completed. Are retimbering ground at top of the winze; also the south drift, 300 level. The raise from east crosscut, 1100 level, continues in low-grade ore. The raise from east crosscut, 1500 level, is up 20 feet; top in three feet of ore assaying $20. The south drift from the bottom of Potosi winze, 1850 level, is out 67 feet from footwall; face in quartz and porphyry. The northeast drift from the 1800 station, Ward shaft is out 870 feet; face in porphyry. Extracted and sent to mill the past week, 464 tons of ore from the 550, 930, 1100, 1150 and 1300 levels. Worked during the week, 465 tons. On hand at mill, 80 tons; average battery assay, $20.03; average car sample assays, $23.67. Shipped to the Carson Mint 420½ pounds of crude bullion.

WARD SHAFT.—The joint Alpha and Exchequer west crosscut, 1800 level, is out 68 feet; face in clay and porphyry. The joint Potosi and Bullion northwest drift, 1800 level, is out 870 feet; face is in porphyry.

IMPERIAL.—General repairs throughout the mine, especially on the 300-foot and sagebrush levels, are now going on.

BULLION.—The upraise from the east crosscut 320 feet south of north line, 1300 level, is up 75 feet. Have started a drift north from top of raise, which is out 12 feet; face in porphyry and streaks of quartz. The joint southeast drift from the bottom of Potosi winze, 1800 level, is out 67 feet from footwall.

EXCHEQUER.—The joint west crosscut on our north line of Exchequer, 1800 level of Ward shaft, is out 68 feet; face in clay and porphyry.

ALPHA.—The joint west crosscut on our north line of Exchequer, 1800 level of the Ward shaft, is ont 68 feet; the face in clay and porphyry.

CONFIDENCE-CHALLENGE. — The joint Confidence-Challenge northwest drift on snrface level is in 1091 feet from the Yellow Jacket shaft, or 233 feet from the north line of tbe Yellow Jacket; the face shows quartz of no value. Tbe joint Confidence-Challenge north drift, 100 level, is in 1236 feet from the Yellow Jacket shaft. The face shows quartz having no value. The joint Cballenge-Confidence east crosscut from tbe east drift on the same level is out 33 feet. The face shows quartz having no value. The joint Yellow Jacket and Challenge drift from north drift on the surface level is ont 45 feet. The face shows quartz having no value. No ore is being shipped from either Confidence or Challenge at present on account of scarcity of water in the Carson river.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extrscted and milled 170 tons of ore of the assay value of $18 per ton as per battery samples.

YELLOW JACKET.—General prospecting is going on in different levels of the mine, but no ore is being shipped on account of scarcity of water in the river.

NEW YORK.—The north drift from No. 3 crosscut, 650 level, is out 63 feet; face in quartz of low grade. The south drift from the winze, 50 feet below the 650 level, is out 24 feet; face in ore of good grade.

SILVER HILL.—During the week have hoisted 364 cars of ore from the 390 snd 260 levels. Sent to the mill 202 940-2000 tons. Milled during the week 202 940 2000. Average car-sample assays, $24.56; average battery assays—gold, $15.31; silver, $7.77; total, $23.08.

Ploche District.

LACK OF WORK.—Pioche *Record*, Sept. 22: Quite a number of miners, for lack of work, have taken leases on several of our mines, and are taking ont considerable fair-grade ore. They have no difficulty in finding a ready market at the smelter. Most of the idle men in town have pulled out for Monkey Wrench, anticipating work. The camp has now all the men that can be employed until sucb tinie as the mines are more developed. It looks as if the smelter did not intend resuming operations for some time. Since the closing down everything has been put under lock and key, and a general air of quietude pervades the works.

Silver King District.

THE MINES.—Pioche *Record*, Sept. 22: In the Silver King district, 40 miles west of Pioche, in Lincoln county, msny good mines of silver, lead and free-milling ores are to be found. Not mnch doing, as the Wall street palsy—that is, the price of silver—forbids it. The prominent mines of this city are owned by Mr. Cupid, of Ely, Mr. Boskowitz of San Francisco, Wheatley Bros., of Pioche, and others.

Robinson Canyon District.

A FEW MEN WORKING.—Pioche *Record*, Sept. 22: Robinson Canyon, Wbite Pine county, is a much talked of camp. Tbe ores of tbis camp are principally gold. The Johannah and Chainman mines are the hope of the camp. They are working a few men, and are reducing the ore with an old-fashioned stamp-mill at Ely. So far as experts are concerned, it would have been a good thing for Robinson Canyon if tbey all had been hung in early days. These fakirs have done much to hurt the camp.

Cherry Creek District.

CLOSED DOWN.— Pioche *Record*, Sept. 22: Cherry Creek, 50 miles north of Ely, is a well-tried camp, but everything is closed down. With silver at a fair price, Cherry Creek camp wonld be equal to anything in the connty. The most famons mine in the camp—the Star—is the property of A. C. Cleveland of White Pine and a Mr. Haywood of California.

Tuscarora District.

NAVAJO.—*Times-Review*, Sept. 24: Work for the week has been confined to stopes above the 350-foot level, which continue to look abont the same.

BELLE ISLE. — North drift, 250-foot level, extended five feet; the face is still looking very well. Stopes near the upraise, same level, are now breaking into tbe ore.

NORTH BELLE ISLE.—North drift, south 300-foot level, extended five feet; the ore continues high grade. Have started a stope from No. 1 raise on the south 400 No. 3, which is showing some fine ore.

NEVADA QUEEN.—Second level — East line stope advanced 14 feet, total 156 feet, in vein formation giving low assays. North intermediate drift from No. 6 chute extended 22 feet, total 138 feet, exposing seam of good ore. Stopes east of No. 3 east crosscut have seams of good ore. Produced four tons first class ore assaying $260 per ton, and 48 tons of second class, assay $26 per ton.

COMMONWEALTH.—Second level — East drift from No. 3 chute advanced 23 feet, total 93 feet, in low grade vein matter. Third level—South drift from No. 1 chute in 75 feet, giving low assaye. West drift from same point is in 42 feet, also in low grade ore. Hoisted three tons first class ore, assay $230 per ton, and 40 cars second class, car sample $26 per ton.

Central District.

LONE STAR MINE.—*Silver State*, Sept. 24: Jack Pool and Charley Harvey are making preparations to start work on the Lone Star mine. This mine has been developed by a shaft to about 60 feet, and the ore body runs from top to bottom of the shaft, on an average of abont 20 inches thick, and assays $40 to the ton in gold, with a small percentage of silver. Messrs. Pool and Harvey have been working a lead mine in Antelope district until a few months ago, and on account of the low price of silver had to qnit work, as it takes very rich ilver ore to make it pay at 83 cents per ounce. The boys are good rustlers and we wish them every success in the Lone Star mine.

OREGON.

MILL MOVED.—Jacksonville *Times*, Sept. 23: Honck & Shaefer bave removed their quartz mill to Woodville, to work up the ore on the dump of the mine they recently purchased from W. J. Stanley, in connection with Robt. Taylor and R. Beswick of Ashland. The Judson quartz mill, which has been doing service in Slate creek precinct for some time past, was last week removed to Wolf creek, wbere it will be operated on some promising ledges under the management of Mr. Boyd, a first-class mining expert.

LUCKY BAR MINE —Grant's Pass *Courier*: This valuable placer is situated on Sucker creek, ten miles from Althouse postoffice, and is giving evidence of the foresigbt and perseverance of its owners, Messrs. Devore, Razee and Weidman. For the past five years tbis mine hss been worked at a continual expense, but recently rich pay dirt has been found in blue gravel which lies seven feet thick down near the bedrock, which hss not yet been reached except throurh prospecting shafts. Coarse gold is known to exist in paying quantities on the bedrock and drifting will proceed when that point is reached. Water-power is used to hoist the water and pay dirt to the boxes on the upper end of a 24-foot incline, and the same water which does the hoisting wsshes the debris from the gold. The famous Josephine county caves supply the stream which is being utilized by tbe owners of the mine. Wm. M. Richards, a mining man of experience and good judgment, has charge of the works, and tbe owners cannot help feeling gratified at the "sand" they have exhibited in bringing the investment to a paying basis. Other bars on Sucker creek will be worked by parties encouraged hy the result of development at Lucky Bar.

SOUTH DAKOTA.

STILL BUYING GEOUND.—Deadwood *Pioneer*, Sept. 24: Thos. H. White, on bebalf of tbe English syndicate of which he is general manager, took up, yesterday, the bond on the Beaver fraction, paying therefor $5000. The syndicate bas still a large number of claims bonded, and is taking them up as rapidly as the options mature. It has already expended over $300,000 in the purchase of ground, and before it hss secured all the property wanted will have paid out fully a half million dollars. Arrangements for the erection of a large reduction plant are not fully completed.

AN IMPORTANT FIND.—It has recently developed that tbe diamond drill, which has been in operation on the Florence Co.'s ground in Nevada gulch, up to within the last few days, bored through a stratum of excellent quartzite at a depth of 180 feet, and operations with tbe drill were at once discontinued. The owners merely wanted to prove the existence of the quartzite in the ground, and will soon commence sinking an operating shaft for ore. The discovery is probably tbe most valuable ever made in Bsld mountain. In Nevada gulch there exists a seemingly barren chsnnel covering a considerable ares, from whicb the quartzite appears to have been washed off, leaving the barren slates exposed. The appearance of this ground hss discouraged extensive prospecting, as, although its location wonld indicate it was on the helt, it was thought impossible for ore to exist there. The Florence management thought differently, and began prospecting with a diamond drill, with the result that the quartzite was found with shale on top of it, and an almost certainty of finding ore. Properties abutting on this company's ground, which have heretofore been coosidered almost valueless, bave acquired a new worth, and no doubt will be subjected to important exploration and development work.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept 7.		WEEK ENDING Sept. 14.		WEEK ENDING Sept 21.		WEEK ENDING Sept. 28.	
Alpha	.15	....	.15	....	.25	.35	.30	.50
Alta	.25	....	.20	.25	.25	.65	.40	.65
Andes	.35	.40	.35	.40	.45	.70	.55	.90
Belcher	1.00	1.20	1.15	1.80	1.70	3.20	3.00	6.50
Belle Isle	....	....	....	....	....	....	.15	....
Best & Belcher	1.20	1.40	1.25	1.40	1.30	2.75	2.65	3.80
Bullion	.20	.25	.10	*.50	.45	.85	.65	.95
Bodie Con	.30	.60	.35	.40	.40	.45	.45	.60
Bulwer	....	....	.30	.35	.35	.35	.35	.50
Commonwealth	....	....	.05	....	....	....	.05	....
Con. Va. & Cal	3.20	3.35	3.15	3.35	3.10	4.20	3.65	5.00
Challenge	.25	.30	.35	.40	.35	.55	.70	1.60
Chollar	.60	.60	.55	.65	.60	1.15	1.00	1.60
Confidence	1.10	1.20	*1.05	*1.60	2.25	3.25	3.00	3.50
Con. Imperial	.05	....	....	....	.05	....	.10	....
Caledonia	.20	....	.20	....	.20	.35	.30	.45
Crown Point	.60	.65	.65	.70	.65	1.30	1.20	2.25
Crocker	....	....	.05	....	.10	....	.10	....
Del Monte	.05	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	2.00	....	1.90	2.00
Exchequer	.05	....	.20	....	.20	.35	.30	.40
Grand Prize	....	....	.06	....	....	....	....	....
Gould & Curry	.80	....	.90	1.00	.95	1.60	1.30	2.00
Hale & Norcross	.85	1.00	.90	*1.40	1.50	2.55	2.30	4.16
Julia	.05	....	....	....	.10	....	.10	.20
Justice	.15	....	.15	....	.20	.35	.30	.45
Kentuck	.10	.15	....	....	.15	.30	.25	.40
Lady Wash	....	....	....	....	.10	....	.15	.25
Mono	.10	.15	.15	....	.10	.15	.20	....
Mexican	1.20	1.35	1.30	1.45	1.30	2.45	1.80	2.80
Navajo	....	....	.06	....	....	....	.15	....
North Belle Isle	....	....	....	....	....	....	.05	....
Nev. Queen	....	....	.10	....	....	....	.16	....
Occidental	.30	....	.30	....	.30	.50	.40	.55
Ophir	2.20	2.35	2.30	2.45	2.30	3.20	2.95	4.05
Overman	.35	.40	.35	.45	.45	.95	.70	1.65
Potosi	.65	.69	.60	.7	.65	1.15	.95	1.70
Peerless	....	....	....	....	.10	....	.10	....
Peer	....	....	....	....	....	....	.15	....
Savage	.70	.85	.75	.90	.85	1.65	1.30	3.00
S. B. & M	.25	....	.25	.30	.25	.75	.65	1.15
Sierra Nevada	1.35	1.65	1.60	2.10	1.76	2.60	2.20	3.00
Silver Hill	.05	....	....	....	.10	.20	.20	.35
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.20	1.35	1.25	1.45	1.35	1.95	1.65	2.15
Utah	.26	....	.30	.35	.35	.45	.35	60
Yellow Jacket	.50	.65	.60	.70	.60	1.15	1.00	1.85

*Assessment added.

Market Reports.

Local Markets.

SAN FRANCISCO, Sept. 29, 1892.

General trade was slow the past week. So far as the writer was able to learn no branch of trade showed any degree of activity. Why business is dull at this season of the year it is hard to say, for seldom is found two husiness men who agree on the subject. They admit that the retail trade is carrying small stocks, yet they do not show any great desire to anticipate their probahle requirements; even merchants at remote points, it is said, are not buying winter supplies with their usual freedom. The only reasonable solution for the present general stagnation in trade circles, and which is not confined to either this Coast or the United States, for it extends to all countries, is traceable to the cry of hard times which was raised fully three years sgo and which gained in prominence as the months passed. During times of general d pression every person lives more economical and it is this economy which has so telling an effect on the markets of the world. Besides this, the low price of silver has largely reduced the purchasing power of heavy consuming countries. With a large curtailed demand from this source, exporting countries are made to keenly feel the falling off. Commenting on this view of the situation, Cordley & Co., of New York, says:

Most all clouds have a silver lining, but at the same time it is rather rough to laugh at and gloat over a man who has to take his own medicine, hut it is certainly very interesting to watch the development of the silver situation in England. English newspapers and public speakers have for a long time crooked about the dire disaster coming to the United States from its over-is ue of silver-money, and have never had a thought that their chickens might come home to roost. They are, however, evidently waking up to the fact that a good deal of their own monetary disturbance is due to the present silver situation as affecting all of their colonial interests and trade, and that in order to save those interests and protect that trade they have got to fall into line with us and help to put silver on a different basis. The British Government evidently dislikes to recognize the situation, but it is being forced home to th m hy their mercantile and manufacturing constituency. While mercantile and financial disasters in England will be, of course, more or less reflected in this country, and hinder English investment in our stocks and bonds, if not inducing further sales of them, and thereby directly affecting our markets, ultimate good is certain to come from the present difficulties.

The local money market is reported unchanged. The activity in mining shares calls for more funds hut so far as we are able to learn the increased call ls readily met. The active mining share market has not, as yet, brought out the class of of outside buyers that it looks as if the inside are trying to get in their net, for the savings hanks do not report any withdrawal of funds by depositors, hut if the present activity in shares continues, it is thought that the depositors will he invcigled into the business when the savings hanks will lose large sums of money which, of course, will go into the pockets of the inside mining-share sharks. The Merchants report increasing remittances from the interior hut as a rule, interior merchants do not owe as much as they usually do at this season of the year. New York advices report that the cholera scare is wearing off and with fears being allayed, there is more disposition to invest money and operate in speculative securities. European mail advices do not report any material change in the general situation.

SILVER —In London the market price for silver hullion has held unchangeably steady, and in New York there has not heen any change since last Friday. The steadiness of the market is a source of surprise, and gives rise to considerab'e speculation regarding its future course. The general opinion is that the price will recede and may possibly go considerably lower than the lowest point touched in this year. This opinion, no doubt, is founded nn the fact that heretofore a steady market was followed by a break. Advices continue to come to hand reporting silver-producing mines shutting down owing to the product not meeting current expenses. Late advices from England confirm the reports that the home government has given the Australian colonies authority to mint silver. The particulars regarding the authorization we are not ahle to get at this writing. The exports hy sea the past week aggregate $118,150 in bullion to Japan.

MEXICAN DOLLARS—Exports the past week aggregate as follows: $143,660 to China and $244,000 to Japan. The market is fairly steady at 67 to 67¼ cts.

QUICK SILVER – Receipts the past week aggregate 356 flasks. The market appears to have a steadier tone.

BORAX—Receipts the past week aggregate 1061 centals, and exports 2410 centals to New York and 93,700 lbs of borates to Liverpool. The market is firmer, with a good Eastern demand reported.

LIME—Receipts the past week aggregate 3026 hbls. The market is slow at $1.25@1.50 per hbl.

ANTIMONY—The market is barely steady. Our quotations might possibly be reduced and still he an outside figure.

TIN—Imports the past week aggregate 6308 boxes plate. The market for pig is steady under moderate stocks and a fair demand for the season of the year. Tinplate is inactive, with the season for the consumption demand from canners passed. Eastern and English advices report slow and weak markets for pig.

PIG LEAD—The market has held barely steady. At the East the market is reported fairly active, hut under heavy supplies prices have shaded.

PIG IRON—The market is dull. To place large consignments, concessions are still in order. London cables report stocks greatly reduced, hut the depression in manufactured iron and steel is against the market. *Iron Age* reports the New York market as follows: "From practically every important distributing point of foundry and forge irons come reports of a firmer attitude of the market. This is due primarily to the attitude of the leading southern furnace companies, which have marked up their prices 25c per ton. As yet, there is very little evidence that they are making any sales, hut it is pretty clear that huyers are taking a little more interest in the market and are more readily picking up what bargains are offered. It is likely that when these have disappeared, they will settle into an attitude of watchful inactivity and test the new-found courage of the makers."

COPPER—The market is weak, with large buyers getting concessions. The markets at the East and also abroad are lower, an increase in the visible stock and quantity afloat being against the market.

COAL - Imports the past week aggregate as follows: Sydney, 2620 tons; Liverpool, 2300; Departure Bay, 2500; Seattle, 3600; totals, 11,020 tons. The market for shipment is reported stronger for hoth English and Australian. The spot market is essentially unchanged. Importers and large handlers continue confident that better prices will rule hefore the fall months pass.

Mining Share Market.

SAN FRANCISCO, Sept. 29, 1892.

The Share Market the past week under review, was quite active with lively and attractive fluctuations. On Thursday, Friday and Saturday the north end shares under the lead of Con. Virginia and the middle shares with Hale & Norcross the leader made quite an advance. The highest figures were reached on the Call, Friday afternoon, when Con. Virginia touched $5; Ophir $4.05, and Hale & Norcross $4.15. The Gold Hill shares under the lead of Belcher also showed a substantial advance. Belcher advanced from $3 on Thursday morning to $5.75 on Friday afternoon. Saturday the market eased off, opening weak and inactive on Monday morning for the north ends and fairly firm for the Gold Hills. In the afternoon the latter strengthened which led up to a rapid advance. Tuesday, at the Call, Belcher sold at $6 50. The advance brought in more outside buyers, but not of the class the reported broker for D. O. Mills appeared desirous of getting in. What the latter is said to wish is good substantial huyers, those upon whom the mill-rings can rely for assessments. On Tuesday the chipping fraternity and the large majority of "mud-hens" and "gutter-snipes" began to unload, taking their profit. This unloading was met by lower prices with a rapid decline on yesterday (Wednesday). The decline is generally accepted as proof positive that the inside does not want to take shares in at an advance, and in not being willing to do so it looks more than ever before like the usual thieving deals to which the public has heen treated since the spring of 1887.

Yesterday the north end and middle shares had a fairly steady tone, which gives the impression that the inside was about ready for another slight up in them so as to prevent a wholesale selling hy outsiders, in which event another up move would he only the more difficult to make. Perhaps this may be what the MINING AND SCIENTIFIC PRESS of Sept. 17, warned the public against. In that issue we said: "It looks very much as if D. O. Mills has instructed Bob Morrow to give the brokers a few crumbs by sending the market up and at the same time, provided gudgeons are drawn in, sell the market down after the leading shares are advanced to certain figures. In selling the market down there must, to make it a success, be rallying points." If this is not the move, then we will probahly he treated to higher prices than have yet heen reached so as to disarm the public of all suspicion and inspire confidence hy which they will hold. It will he the old game, "huy on the breaks for a turn," and the huying will he done once too often, when heavy losses and assessments will have to be met. As long as the mills are run hy private parties and the mines not worked to conform to the laws under which they incorporated, the public had better let the thieving game severely alone.

If the mines are being honestly worked and the ore honestly milled, why is there so much secrecy about everything? And why is the law under which the companies incorporated not conformed to?

It is a great game, this, of working the Comstock mines; it is assessments for the public and hullion for the insiders.

The official letter received this week from the superintendent of Crown Point reports 12 miners at work and 30 other persons in various wage-drawing positions. That is the way the money goes, pop goes the assessments.

The dummy directors in several of the mines are disgusted, for had they known that the present deal was contemplated larger assessments would have been levied, but they find comfort in the thought that the deal insures them assessments for at least a year to come. It is a great game, this, of working the Comstock mines.

The market opened this (Thursday) morning active, at lower prices, for the Gold Hill shares and fairly steady for the middle and north-end shares. After regular call, Belcher sold down to $3.60, but soon recovered to $4.10; then it began to shade off. As the noon hour drew near, the middle shares, under the lead of Hale & Norcross, made quite an advance—from 25 to 50 cents. There is a report on the street that the manipulators of the middle and north-end shares had unloaded on the Gold Hill manipulators, which broke the latter's shares, and that while breaking, Belcher, Crown Point and other shares in that and the middle and north-end shares were bought up. While we do not believe that there is any fight, yet it is quite likely that the selling and buying were done as report says, but it was in the interest of one crowd only. The market now looks as if the move is to be in the middle and north-end shares.

Our advices from the Comstock mines report that

n Con. Virginia they are getting ready to take out the very rich ore uncovered to the west on and around the 1700-foot level. If they attempt to take out the ore, we are authoritatively informed that the company will be enjoined by a west-side company which claims the lode. Our advices also state that it is said, the Savage Co., under the reform management of Geo. Wells, H. Zadig and one or two other inside reformers, is hoisting $300-per-ton ore at night and loading it on the cars at 6:15 o'clock in the morning. Our informant claims that he has good reason for believing this to be the case. It is a great game, this, of working the Comstock mines. Outsiders under the present system of working the mines, and of milling ore, have about as much show of getting anything out of the business as a hen without claws has of getting a living by scratching for worms. The showing now made in Belcher, if made a few years ago, would have sent the shares to $20, but the present manipulators appear to be content with a few dollars and assessments. In Hale & Norcross on the 1800 foot level they are cross-drifting for the west lode so as to cut its downward continuation. Good results (selling out shares) are expected to follow. The work in Mexican continues to be ignored, but perhaps the rings want more of the shares before reporting results. Every move that is being made looks more and more like all former thieving deals. Silver Hill, it is said, can pay dividends from the 2000 tons of rich gold ore which was extracted, and is now ready for hoisting. Trouble may follow if dividends are not paid. Very important work is under way in several of the mines, but it is hard to get particulars sufficiently verified to justify publishing.

San Francisco Metal and Coal Market.

ANTIMONY.			STEEL.		
Per lb	— @	13½	English, lb	— @	18
BORAX.			Canton tool	— @	8½
Refined, in car lots	— @	7½	Bl'k Diam'd tool	8½@	15
Powdered, do	— @	7½	Pick & Hammer	@	10
Concentrat'd, do	— @	6½	Machinery	4 @	5
All grades jobbing at advance			Toe Calk	— @	4½
COPPER.			TINPLATE		
Bolt	22 @	—	B. V. steel grade		
Sheathing	22 @	—	14x20, spot	— @	5 87½
Ingot, jobbing	— @	14½	Charcoal, 14x20	— @	5 87½
Do, wholesale	— @	13½	Do roofing, 14x20	— @	5 87½
Fire Bar Sheets	22 @	24	Do, do, 20x28	— @	11 75
IRON.			PIG TIN.		
Bar, base	— @	3	Spot ₱ lb	— @	23
Norway, base	— @	4½	COAL.		
PIG IRON.			SPOT FROM SALE—PER TON.		
	Spot.		Wellington		$8 00
Eglinton ₱ ton	22 00 @	—	Creta		6 75
Glengarnock	23 00	—	Nanaimo		7 00
Am. Soft, No. 1	24 00 @	—	Gilman		6 00
Oregon Pig	— @	—	Seattle		6 50
Puget Sound	— @	—	Coos Bay		5 50
Clay Lane White	24 00	—	Cannel		8 50
Langloan	22 00 @	—	Egg hard		11 50
Thrnecliffe	23 00 @	—	Cumberland, in sacks		14 00
Cartsherrie	22 00 @	—	Do, bulk		13 00
Barrow	22 00 @	—	Wallsend		7 00
Carnbfiect	22 00 @	—	Scotch Splint		7 00
CHROME IRON ORE.			Brymbo		6 75
Per ton	10 00 @	—	West Hartley		7 50
LEAD.			TO LOAD—PER TON.		
Pig	— @	4½	Australian	6 00 @	—
Bar	— @	5½	Liverpool steam	6 00 @	—
Sheet	— @	7	Scotch Splint	5 00 @	—
Pipe	— @	6½	Cardiff	5 25 @	—
SHOT.			Lehigh Lump	12 00 @	—
Drop, sizes *smaller* than B, ₱ bag of 25 lbs	$1 85		Cumberland	9 00 @	—
Do do, B and *larger* sizes ₱ bag of 25 lbs	2 10		West Hartley	6 50 @	—
Buck, Balls and Chilled do, ₱ bag of 25 lbs	2 10		COKE.		
QUICKSILVER.			English, to load	$8 00 @	9 00
Home trade, pr. flask	41 50 @42 00		Do, spot, in bulk	— @	10 00
For export	35 50 @36 00		Do, in sacks	— @	12 00
			Cumberland	9 00 @	—

Eastern Metal Markets.

NEW YORK, Sept. 29.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38½	83	11 00	4 00	20 15
Friday	38½	83¼	11 00	4 00	20 15
Saturday	38½	83¼	11 00	4 00	20 15
Monday	38½	83¼	10 85	4 00	20 15
Tuesday	38½	83¼	10 85	4 00	20 15
Wednesday	38½	82½	10 85	4 00	20 15

Quicksilver has a steady tone. Pig tin is barely steady. Copper is lower and weak at the decline. Lead is offered freely. Pig iron is steady at the recent advance.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

STONINGTON PHOSPHATE CO. Object, to deal in all kinds of nitrates, guano and shell deposits in the Pacific ocean, and to acquire rights under Acts of Congress relating to the Guano islands. Capital stock, $100,000. Directors—Shafter Howard, J. A. Magee Jr., T. J. Harris, Jas. Madison and L. E. James.

SUMMIT LAKE WATER CO. Capital stock, $5,000,000. Directors—T. J. Parsons, Byron Jackson, A. W. Robinson, E. P. Rann, I. W. Ross, O. W. Forsyth and Wm. Strader.

COMSTOCK-WATSON CO. (Oakland). Capital stock, $10,000. Directors—M. L. Reqna, C. R Watson, Carl H. Abbot and K. G. Easton.

TAMAR MANUFACTURING CO. Capital stock, $100,000. Directors—Henry A. Hilton, O. H. E. Opie, J. H. Henderson, A. C. Wagner and John J. Hunter.

BARTON OPERA-HOUSE AND IMPROVEMENT CO. (Fresno). Capital stock, $300,000. Directors, Ella G. Barton, H. W. Chase, A. E. B. Ridley, E. de Reynier and J. O. Buxhee.

MATTIE W. MINING AND MILLING CO. (El Paso Co., Col.; office, Cripple Creek). Capital stock, $300,000. Directors—Joseph H. Wolfe Lloyd Jones, Edward I. Jones, Elmer E. Teal and John B. Whitehead.

FAIR CHANCE MINING CO. (Gunnison Co., Col.) Capital stock, $100,000. Directors—C. T. Harkman, W. D. Wright, J. W. Clarke, F. H. Shaw and G. W. Hart.

DEAD CREEK M. Co. (Denver). Capital stock, $1 000,000. The company will incorporate in Hinsdale Co., Col. Directors—W. H. Lindsay, D. M. Sponsilier, J. W. Lecky, L. J. McMurray, J. F. Gillen, C. H. Clarke, W. H. Winank, E. Morton and C. F. Mnssey.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 20, 1892.

483,035.—BUNG—Anthony & Savage, Oakland, Cal.

482,775.—COIN-OPERATED AIR-COMPRESSOR—R. F. Avery, Spokane, Wash.

482,776—AIR PUMP—R. F. Avery, Spokane, Wash.

482,777.—OPERATING PUMPS WITH TREADLES—R. F. Avery, Spokane, Wash.

483,040—BARBED STRAP FOR BUNCHING LUMBER—E. C. Binet, Clipper Mills, Cal.

483 041.—MECHANICAL MOVEMENT—P. A. Bouchet, Merced, Cal.

482,914.—BITUMINOUS ROCK-REDUCING MACHINA—J. T. Cochran, Oakland, Cal.

482,918.—AXLE-LUBRICATOR—J. Q. Finch, S. F.

482,903.—STREET-RAILWAY SWITCH—J. P. Holedger, Spokane, Wash.

482 929.—CALENDAR—Rendell & Pinney, Tulare, Cal.

483,017.—LAWN-SPRINKLER—N. L. Rigby, Los Angeles, Cal.

482,853.—ORE-SEPARATOR—H. H. Taylor, S. F.

482,976.—HYDRAULIC-MOTOR—M. Van Ensley, McMinnville, Ogn.

482 881—PLOW—C. H. Vanderburg, Florence, Ogn.

482 989—WINDOW-FRAME AND SASH—Jas. Wilson, S. F.

The following brief list by telegraph, for Sept. 27, will appear more complete on receipt of mail advice:

California—John E. Armstrong, Santa Cruz, latch and lock combined; George Bryant, San Francisco, machine for grooving shoe soles; William J. Christy, San Jose, stringed musical instrument; Henry S. Grace, San Francisco, cigarette machine; Andrew S. Hallidie, San Francisco, grip pulley; Ferdinand Hoffman, deceased, by C. E. Hoffmeo, administratrix, fumigator; Benjamin Holt, Stockton, traveling harvester; Stephen M. Irvin, San Bernardino, flume gate; John Keao, San Francisco, chimney cap; George J. Perkins, Truckee, locomotive steam boiler; Alexander J Rudolph, San Francisco, two patents, one for a continuous file or index, the other for a library catalogue; Frederick C. Schroeder, Alameda, floor scraping machine.

Oregon—Nieles J. Blageo, Portland, device for closing elevator shafts; John H. Quloton, Portland, hose-hitching device; Frank S. Raeger, Germantown, reel support.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WINDOW-FRAME AND SASH.—James Wilson, S. F. No. 482,989. Dated Sept. 20, 1892. This invention relates to that class of window-frames in which the sash-confining parts of the casing or frame are so constructed that they can be moved out of the way to permit the removal of the sashes.

BITUMINOUS ROCK-REDUCING MACHINE.—John T. Cochran, Oakland. No. 482,914. Dated Sept. 20, 1892. This is an apparatus for the preparation of bituminous rock for the purpose of forming pavements, sidewalks and other surfaces for which it is applicable. It consists, essentially, in a series of oppositely traveling carrying belts inclosed within a casing and so arranged with relation to each other that each upper belt shall deliver its contents from the discharge end upon the receiving end of the belt below, and in conjunction with this of a series of guides to direct the material, and heaters by which the temperature is raised so that it will be in proper condition for the pulverizing and further work when discharged from the machine. The amount of heat is regulated by suitable cocks in the supply-pipe, so that more or less steam may be delivered into either set of the heating-pipes.

Our Agents

J. C. HOAG—San Francisco.
R. G BAILEY—Sao Francisco.
GEO. WILSON—Sacramento, Cal.
SAMUEL B. CLIFF—Crestoo, Cal.
A. C. GOODFRAY—Oregon.
W. H. MURRAY—California.
E. H. SCHAEFFLE—El Dorado and Amador Co's.
C. E. ROBERTSON—Humboldt Co.
CHAS. E. TOWNSEND—Nevada and Placer Co's.
R. G. HUSTON—Mootana.

DELINQUENT SALE NOTICE.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of Works, Amador City, Amador County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 23d day of August, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
John S. Haver	11	238	$233 00
John S. Hager	130	100	100 00
M. J. McDonald	137	500	500 00
E. D. Rue, Trustee	138	925	9 5 00

And in accordance with law, and an order of the Board of Directors, made on the 22d day of August, 1892, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 310 Pine St., Room 43, San Francisco, California, on TUESDAY, the 18th day of October, 1892, at the hour of 12 o'clock M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. H. ISHAM, Secretary.

Office, 310 Pine St., room 43, San Francisco, Cal.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2, Oct 6, Oct 27		C E Elliott, 3 9 Montgomery
Belle Isle M Co, Nevada	15	10c	Aug 22, Sept 26, Oct 20		J W Pew, 310 Pine
Best & Belcher M Co, Nevada	52	25c	Aug 17, Sept 22, Oct 13		L Osborn 309 Montgomery
Bullion M Co, Nevada	50	25c	Aug 11, Sept 16, Oct 4		R R Crayson, 331 Pine
Challenge Cons M Co, Nevada	12	10c	Aug 24, Sept 27, Oct 18		O L McCoy 331 Pine
Commonwealth Cons M Co, Nevada	9	10c	Sept 7, Oct 13, Nov 9		R R Crayson, 331 Pine
Confidence M Co, Nevada	21	50c	Aug 13, Sept 15, Oct 6		A S Croth, 414 California
Crocker M Co, Arizona	12	5c	Aug 11, Sept 20, Oct 18		A Waterman, 3 9 Montgomery
Crossbow M Co, California	1	10c	ug 4, Sept 12, Oct 3		H D Walker, 3 9 Montgomery
Crown Point M Co, Nevada	53	25c	Sept 15, Oct 20 Nov 10		J Newlands, 331 Pine
Del Monte M Co, Nevada	6	10c	July 26, Sept 5, Oct 5		J W Pew, 310 Pine
Derbec Blue Gravel Co, California	10	10c	Sept 14, Oct 17, Nov 7		T Wetzel 320 Sansome
Eureka Con Drift M Co, California	5	0c	Sept 19, Oct 24, Nov 14		D M Kerr, 330 Pine
Evening Star M Co, California	5	1c	Aug 19, Sept 21, Oct 8		J J Scoville 320 Sansome
Gray Eagle M Co, California	30	6c	Sept 28, Oct 31, Nov 21		A W Barrows, 3 3 California
Guascarau & California M Co, Honduras	7	$1.50	Aug 9, Sept 15, Oct 5		E Oliver, 22 Mint Avenue
Hale & Norcross M Co, Nevada	102	50c	Aug 11, Sept 15, Oct 7		A B Thompson, 3 9 Montgomery
Independence M Co, Nevada	17	5c	Aug 15, Sept 29, Oct 13		J W Pew, 3 0 Pine
Inyo Marble Co, California	18	50c	Sept 2, Oct 22, Dec 1		A F Thane, 137 Montgomery
Jack Rabbit M Co, Nevada	1	5c	Sept 17, Oct 19, Nov 8		T Wetzel, 320 Sansome
Keystone Con M Co, California	3	$1	Aug 22, Sept 26, Oct 18		J H Isham, 310 Pine
Mooo M Co, California	32	15c	Sept 15, Oct 24, Nov 14		H D Walker, 3 9 Montgomery
Navajo M Co, Nevada	22	10c	Aug 17, Sept 21, Oct 14		J W Pew, 310 Pine
North Belle Isle M Co Nevada	20	10c	Sept 1, Oct 8, Nov 7		J W Pew, 310 Pine
Northwestern G M Co, British Columbia	5	20c	Aug 17, Sept 25, Oct 15		F Bonacina, 438 California
Peer M Co, Arizona	13	10c	July 19, Sept 8, Oct 6		A Waterman, 3 9 Montgomery
Silver King M Co, Arizona	9	25c	Aug 26, Oct 7, Nov 4		J W Pew, 310 Pine
Teresa M Co, Mexico	8	10c	Aug 13, Sept 22, Oct 8		K J Willats, 309 Market
Yellow Jacket M Co, Nevada	52	25c	Sept 5, Oct 7, Nov 11		W H Blauvelt, 331 Pine

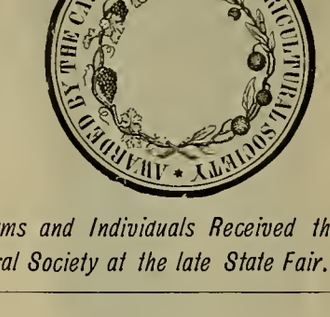
MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Idlewild M Co	Annual	E F Stone, 305 Pine	Oct 12
Middle Creek M Co, California	Annual	H D Hawks, 313 Pine	Oct 6
Presidio M Co	Annual	L Osborn, 309 Montgomery	Oct 3

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L Osborne, 3 9 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Con Cal & Virginia M Co, Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	June 8
Pacific Coast Borax Co, California	1 00	A H Clough, 230 Montgomery	Sept 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 28

STATE FAIR, 1892.



The following San Francisco Firms and Individuals Received the Highest Awards of the State Agricultural Society at the late State Fair.

J. W. GRACE & CO,
BEST HYDRAULIC CEMENT, "Jasson."

WASHBURN & MOEN M'F'G CO.,
BEST WIRE ROPE.
BEST WIRE GOODS.

PELTON WATER WHEEL CO.
BEST WATER WHEEL---THE PELTON.
BEST QUARTZ CRUSHER---THE GATES.

ELECTRICAL ENGINEERING CO,
BEST DYNAMO AND MOTOR.
BEST SYSTEM OF ELECTRICAL POWER TRANSMISSION.
BEST ELECTRIC PUMP FOR IRRIGATING AND MINING.

W. H. OHMEN,
BEST COMPOUND AUTOMATIC CUT-OFF STEAM ENGINE.

F. A. HUNTINGTON,
BEST QUARTZ MILL.
BEST ORE FEEDER.

GEO. E. WOODBURY,
BEST CONCENTRATOR FOR ORES OF ALL KINDS.

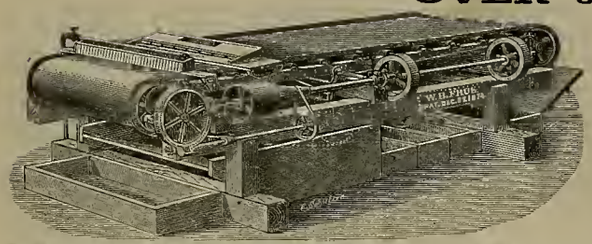
TROWBRIDGE & DYKES, Berkeley,
BEST WELL PUMP.
BEST MINING AND IRRIGATING PUMP.

A. T. DEWEY
W. B. EWER.
GEO. H. STRONG.
Dewey & Co.'s Scientific Press Patent Agency (ESTABLISHED 1860)

INVENTORS on the Pacific Coast will find it greatly to their advantage to consult this old, experienced, first-class Agency. We have able and trustworthy Associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies the information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not few. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, San Francisco.

FRUE ORE CONCENTRATOR

OVER 3200 IN ACTUAL USE.



Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; and March 31, 1891.

SAN JACINTO ESTATE, LIMITED,
Office of General Manager,
P. O. Address, South Riverside, San Bernardino Co., Cal.
CAJALCO, Dec. 18, 1891.

MESSRS. ADAMS & CARTER, 132 Market Street, San Francisco, Cal.—GENTLEMEN: After a continuous trial of different concentrators comprising the Frue Vanner, the "Holland," "Parsdox," "Triumph" and the "Woodbury" concentrators), extending over several months, we find that we prefer the Frue Vanner, as it is easier of adjustment, runs smoother, has less wear and tear, and—having a positive travel—gives less trouble than the other more complicated and ever changing machines now in use here. The Frue Vanner not only saves a cleaner concentrate, but has less loss in the tailings, and is in several ways preferable to the other concentrators here.

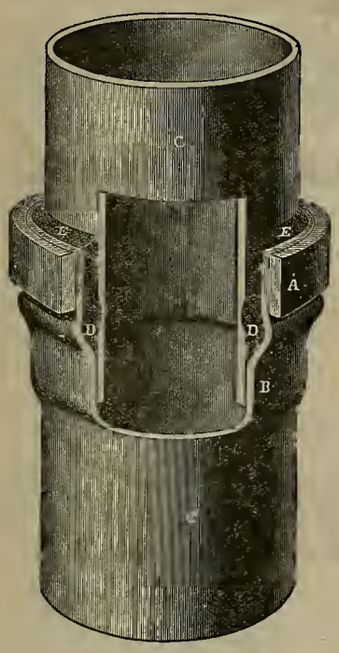
I am, my Dear Sirs, Yours faithfully,
S. HARRIS, Manager.

Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
" " " Improved Belt Frue Vanner..... 800. f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 800, f. o. b.

For any information, or for pamphlets, or for circulars or testimonials, call on or address

H. J. SUMMERHAYES, Successor to Adams & Carter, Agent for the FRUE ORE CONCENTRATOR.
No. 132 Market Street. - - San Francisco, Cal.

Matheson Patent Lock-Joint Pipe.



A—Wrought-Iron Ring Shrunk on Pipe
B—Bell End Pipe.
CC—Body Pipe.
D—Lead Space showing point Lock Joint.
E—Lead Space.

SIMPLICITY IN CONSTRUCTION,

Permitting Handling Without the Aid of Skilled Labor.

A RELIABLE JOINT,

Whether Used on Light or Heavy Tubing.

A SAVING IN COST

Of Transportation as Compared with Any Other Style of Wrought or Cast Iron Pipe.

THE MATHESON JOINT is now used to a great extent by many of the largest Natural Gas Lines in the country, as well as for Water Works and other purposes. External diameters of either standard Wrought-Iron Pipe or Tubing can be furnished, and of any desired weight or gauge, in connection with the Matheson Patent Lock Joint, and in maximum lenghts and diameters as follows:

2	inches	to 4	inches	diameter,	16	to 20	feet	long.
5	"	8	"	"	20	" 26	"	"
9	"	12	"	"	20	" 25	"	"
13	"	20	"	"	20	" 24	"	"

WATER GATES, HYDRANTS, STAND PIPES AND ALL NECESSARY TOOLS AND FITTINGS FOR COMPLETE WATER WORKS. SPECIFICATIONS FURNISHED.

IRRIGATION PLANTS OF ALL KINDS,

INCLUDING HYDRAULIC RIVETED STEEL IRON PIPE, CAST IRON AND SCREWED JOINT PIPE AND FITTINGS.

Ball Automatic Steam Engines, Heine Patent Safety Boilers, Tubular Boilers, Iron and Steel Fluming, Davidson Improved Steam Pumps, John H. McGowan's Duplex Pumps and Triple-Plunger Pumps, Van Wie's Improved Centrifugal Pumps.

SEND FOR CIRCULARS.

RISDON IRON WORKS,

SAN FRANCISCO, CALIFORNIA.

NOTICE TO GOLD MINERS!

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For SAVING GOLD!

IN QUARTZ GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

SAN FRANCISCO NOVELTY, GOLD, SILVER AND NICKEL PLATING WORKS,
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☞ SEND FOR CIRCULARS.

JUSTINIAN CAIRE, Agent,
521 & 523 Market St., San Francisco,
—DEALER IN—
Assayers' and Mining Material.
—MANUFACTURER OF—
BATTERY SCREENS AND WIRE CLOTH.

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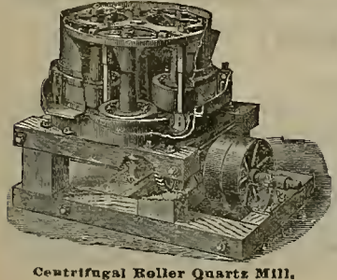

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SAN FRANCISCO, SATURDAY, OCTOBER 8, 1892.

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Varieties of Coal.

Prospectors are often puzzled when coal croppings are found, as to the variety and the method of distinguishing it. Of course an analysis will determine all the points but this is a matter of considerable expense. There are certain simple features which should be recognized on the field by all engaged in prospecting for coal. The different varieties of coal may be classed as follows:

Class I. — Hydrous, containing an excess of combined water; lignite; brown coal; pitch coal.

Class II.—Anhydrous, containing very little combined water; glance coal; semibituminous coal; bituminous coal.

1. Hydrous coal, containing 10 to 20 per cent of permanent water; lignite shows distinctly woody structure; laminated; very absorbent of water. Brown coal rarely shows vegetable structure; fracture irregular, conchoidal; color, dark-brown; luster, feeble; cracks readily on exposure to the atmosphere, losing 5 to 10 per cent of water, which is not reabsorbed; burns slowly; contains resin in large masses.

Pitch Coal. — Structure compact; fracture smooth; conchoidal; jointed in large, angular pieces; color, brown or black; luster, waxy; does not dessicate on exposure, nor is it absorbent of water; burns freely and contains resin disseminated throughout its mass.

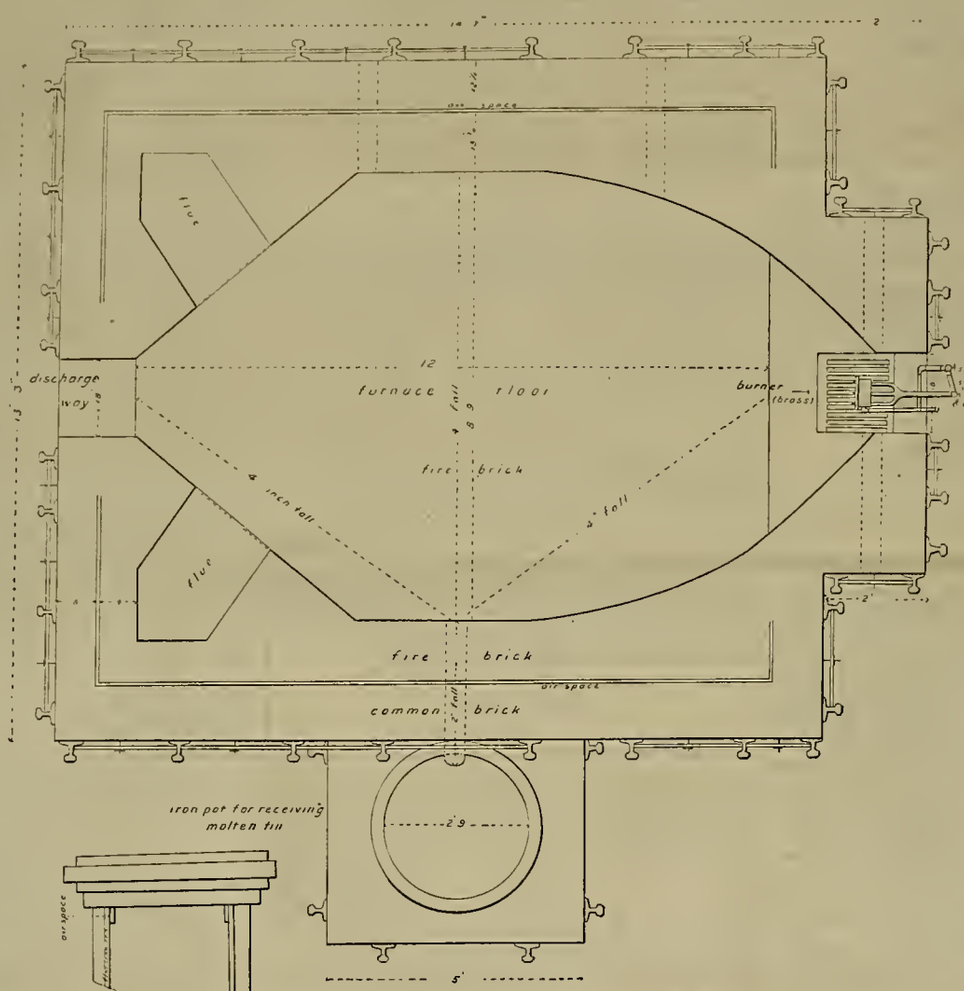
II. Anhydrous Coal. — Containing less than 6 per cent of water.

Glance Coal.—Noncaking, massive, compact or friable; fracture cuboidal, splintery; luster, metallic; structure, laminated; color, black; does not form a caking coal, but slightly adheres. This variety is brown coal altered by igneous rocks, and presents every intermediate stage from brown coal to anthracite.

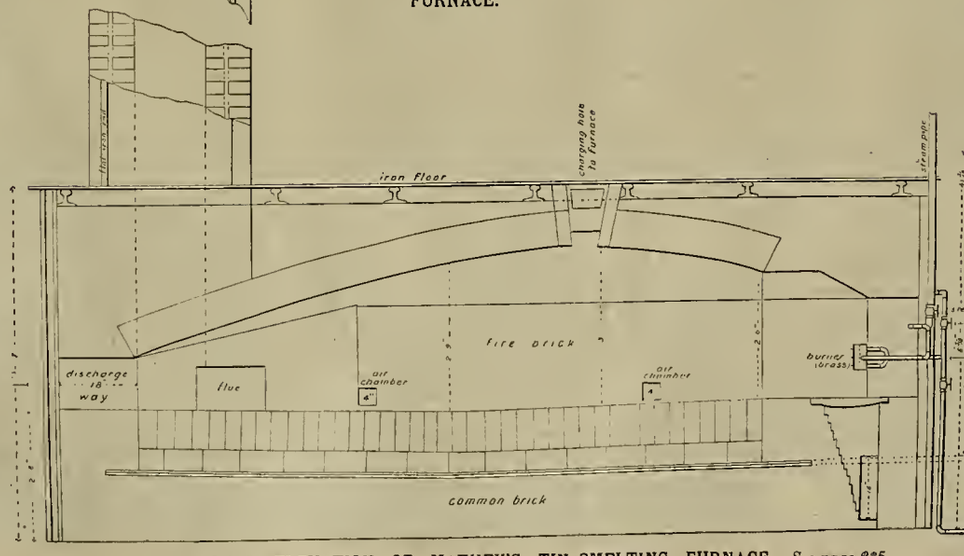
Semibituminous Coal.—Compact with laminæ of bright and dull coal alternately; fracture irregular; luster moderate; cakes moderately, or is noncaking.

Bituminous Coal.—Much-jointed, homogeneous, tender and friable; luster, pitch-like, glistening, often iridescent; color, black with purple hue; powder, brownish; cakes strongly, the best varieties forming a vitreous coke, with brilliant metallic luster.

Anthracite. — Consists almost entirely of carbon, and contains very little hydrogen, oxygen, or nitrogen, that is to say, it is almost free from bitumen — "a native coke." Luster bright, often submetallic iron black, and frequently iridescent. Fracture conchoidal, volatile matter after drying 3 to 5 per cent. Burns with a feeble flame of a pale color.



PLAN (INSIDE) OF TIN-SMELTING FURNACE.



SECTIONAL ELEVATION OF MATHEY'S TIN-SMELTING FURNACE.—*See page 235.*

THE silver-lead miners are having hard times of it these days, with both of those metals at such low prices. Many mines have closed down and more must follow unless an improvement manifests itself shortly. Aside from low price of products in the matter of heavy bullion, the freight charges of the railroads also militate against the profit of far western mines. For instance, the Bunker Hill and Sullivan mines, in the Cœur d'Alene, Idaho, have to pay $30 per ton to get their lead-bullion to Chicago. Mr. Haggin, in Montana, not many hundred miles farther east, gets a rate of $10 a ton to Chicago on his bullion. The far western mines have the worst of it on these freight rates, a few hundred miles farther more than doubling the rate. With lead at four cents a pound, miners' wages $3.50 per day, and freight $30 per ton on bullion to Chicago, a Cœur d'Alene silver-lea mine must have very rich to pay.

A MEXICAN mine, Cosala near San Ignacio, Sinoloa, is turning out $45,000 monthly. The plant consists of four hoisting and two stationary engines, a sawmill, a 25-stamp mill; the ores are treated by the old steam-pan process and the bars are all sent to Culiacan. The mines are managed by an American, Mr. Dodds.

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Our latest forms go to press on Thursday evening.

San Francisco, Saturday, October 8, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Dividend Notice—Pacific Coast Borax Co.
Assay Office and Chemical Laboratory—W. N. Jehu.
Placer Claim for Sale—John Woodard, Missoula, Mont.
☞ *See Advertising Columns.*

Comment.

San Francisco capitalists have of late been turning their attention to Mexican mines, and now that there is a new mining law more favorable to mineowners, investments in that country will doubtless increase. Among the Mexican mines recently purchased by San Francisco men is El Bagre gold and silver mine in the Territory of Tepic, on the west side of the Arroyo Chimaltitan, a tributary of the Santiago river, and about 30 miles from Tepic. This mine has been purchased by El Leopoldo Gold and Silver Mining Co., of which F. Chappelet, the successful California miner, is president and Jabez Howes, secretary. Mr. Chappelet visited the mine a few months since in company with Ross E. Browne, M. E., who reported upon the property. It is on old Spanish mine, and some of the upper levels have been partly worked when Mexico was under the domination of the Spaniards. For years the ore has been worked in a crude way by arrastres, but modern machinery will soon be put upon it. This will be manufactured in this city and shipped down. It is the fashion for Americans to buy old mines in Mexico instead of opening new ones, for the old claims have been but partially developed, and seldom to any great depth. Yet enough work is generally done to prove the claim a mine instead of a "prospect." A cloudburst in the canyon did considerable damage to this mine last July, but last month they had again worked to within 60 feet of the place where there is known to be an 18-foot ledge. The ore contains both gold and silver and runs from $50 to $400 a ton. Some of the ore worked in this city has shown very high returns. The mine has been opened to a depth of 700 feet by means of tunnels, and more recently a 90 foot shaft has been sunk. There is plenty of water for power to drive a 20-stamp mill, compressors, etc. With a longer ditch a 40-stamp mill can be run. The ore can, it is said, be stoped, delivered and milled for $10 per ton with the cheap Mexican labor. It is an advantage to the mechanics and merchants of this city to have such mines owned here, since supplies of all kinds will be forwarded from this market. Arrangements are now being made with one of our local foundries for milling appliances for this mine. Generally, the ores of Mexican mines run to higher values than in this country; but while labor is cheap, supplies are more expensive and transportation rates are excessive. Once equipped, however, with all the necessary machinery, there is money for Americans in Mexican mines.

Next to Michigan and Montana, Arizona is the largest copper-producer in the United States. The ores are, in general, easily worked and occur in large masses. Of the copper properties, the principal ones being worked at present are the United Verde at Jerome, the Copper Basin, 13 miles from Prescott, and the Boggs, 28 miles from Prescott, and the Agua Fria at Stoddard. The United Verde is owned by W. A. Clark of Montana and is a splendid property, and well-equipped with all modern labor-saving appliances. They have three furnaces with a capacity of 200 tons a day, of which two are now in operation. It is estimated they have 25,000 tons of ore roasting at the present time. The ore is easily mined and cheaply reduced. The amount of ore developed in the mine is simply enormous. The Copper Basin and Boggs property belong to Dodge, Phelps & Co. of New York. As a smelting proposition the Copper Basin has not proved a success and they are preparing to leach a portion of their ores. The Boggs property is well-equipped with all appliances. At the smelters, of which they have three, they have Jig machines, Douglass roasting furnaces, in fact everything that a modern plant should have. The mine is two miles from the works. The ore is delivered to the works by narrow-gauge railroad, locomotive and cars complete, at a cost of 15 cents per ton. The ore is rebellious and some time has been lost in experimenting, but they seem to have solved the problem. The Agua Fria Company at Stoddard is in its infancy and there is still a great deal of development work to be done on the mine, but the prospect for large ore-bodies is good. The smelting plant is a 30-ton jacket designed for black copper-smelting, and will require alterations to handle their sulphide ores successfully.

Judge Hawley, in the U. S. Circuit Court, on Monday, rendered a judgment of great importance to the electrical industry, giving, as he did, a sweeping decision in favor of the Brush Co. as against the Electric Improvement Co. It was virtually a decision that the Wood arc light, owned by the Fort Wayne Electric Co., was an infringement on the Brush arc-light patent. In Chicago, New Orleans, Detroit, St. Louis and some other cities, this Wood system had crowded the other arc lights badly. The Wood system had in many places been proven the cheapest, giving, as it does, a 2000-candle light, at from sixty eight to seventy one-hundredths horsepower, which is much less than other systems require. As the horsepower shows the consumption of coal per hour, from a financial point of view, it is hard for other systems to compete with the Wood. This decision, however, puts it out of the way of the other competing companies. The judge upheld the Brush patent, issued a perpetual injunction and referred the case to the Master in Chancery to fix the amount of damages already accrued from the infringement. The defense has the right to appeal within 60 days.

Foundry Notes.

The most important feature of interest among the foundrymen this week is the final decision of the Fulton Iron Works to locate its new plant at Harbor View, on the bay shore of the San Francisco peninsula, instead of at Oakland, as had been contemplated. The proposed sight adjoins the Seaside Gardens at Harbor View, between Black Point and Fort Point, and consists of five lots fronting the bay, having about 980 feet of water frontage. The Union street cable road runs to the tract. About two-thirds of the tract purchased consists of solid ground, and the rest is in water lots, so that more ground can be made when desired. The water is deep off the bay shore in that vicinity, and there are none of the wide mud flats extending out as in the southern part of the peninsula.

The Hendy machine works have had their shops for some time near the seawall, at the base of Telegraph Hill; but with this exception, all the iron works in the city are south of Market street. The manufacturing sites, however, along the north shore are good ones, and when the seawall is completed and the belt railroad extended all around, more establishments will doubtless go in that direction. At present the buildings of the California Wire Works form the largest manufacturing plant in that direction.

The new site of the Fulton will be four or five times larger than their old premises, and they will have plenty of room for their proposed shipyard as well as their general foundry work. The Oakland people are much disappointed at the decision of the Fulton Co., having hoped the works would be built there. The bonus of $10,000 offered was small, and no guarantee of good title to the harbor privilege could well be given by the railroad company, their title being now contested in the courts.

A more potent reason for the change, however, is that James G. Fair, the millionaire, is to invest in the Fulton Company, and the land at Harbor View belongs to him The Fulton Works are to be incorporated with $1,000,000 capital. The incorporators will be the three original proprietors, Daniel B. Hinckley, James Spiers and Daniel E. Hayes, and also James G. Fair, F. A. Huntington, Henry P. Christie and Richard D. Chandler. A first-class plant will be built, and the buildings will be fireproof as far as possible. The firm has twice suffered great loss by fire. The plans will be drawn at once and work commenced as soon as possible.

Debris Dams Legal at Last.

A decision was handed down on Wednesday by Judge W. B. Gilbert of the U. S. Circuit Court in this city which will be hailed with delight by the mining community of this State. It is in effect that, upon a proper showing that debris dams are effective, the hydraulic mines may go on and work. The judgment was in the case of the United States vs. the North Bloomfield Mining Co., and the decision was contained in the closing paragraph of a long and elaborate opinion prepared after an examination of the impounding basins and dam of the mine by the Judge himself. It as as follows:

In short, the danger to be apprehended from the operation of the North Bloomfield mine, with its imponnding reservoirs as constructed and used, and intended to be used, is so remote and improbable that the court is not justified in enjoining the use of the property and thereby interdicting a valuable industry. In arriving at this conclusion, I am not unmindful of the great damage to navigation that has heretofore resulted from the deposit of mining debris, nor of the important interests that are involved, but I am convinced that in the case of this particular mine the contingency has arisen that was contemplated in the decision of this court in the mining-debris cases, in providing that the decree might hereafter be modified upon a showing to the court that a plan to obviate the injuries had been successfully executed.

The injunction will be denied.

This is the most favorable thing which has occurred for the hydraulic-mining interests of this State for years. The North Bloomfield is the most extensive hydraulic mine in California and was taken as the test mine in the original debris suit which led to the closing down of the mines under the Sawyer decision. In other instances where miners have built debris dams they have still been enjoined, so that the dams have been practically illegal because discolored water passed over them. In this decision Judge Gilbert speaks of this subject, and holds that the evidence goes to prove that this light, fine clay is of specific gravity very little greater than water, and will remain in suspense as long as the water moves with a velocity of a mile in two hours. Therefore, it is not likely to do any damage.

As this discolored water has been the cause of many suits against the miners, and the principal basis on which the Antidebris Association has been able to prevent the use of dams, the judge's opinion concerning it is highly important. The question of fact to be determined in this case was whether or not with the use and operation of the impounding works, mining debris escapes from the mine into the Yuba, Feather or Sacramento rivers, so as to tend to impair the navigability of those streams. The court decides that nothing of injurious character does escape, and that therefore the rivers are not injured.

Of course the decision is in a particular case upon a particular mine, but it is of such a character as to show that it will be followed by others of like character provided the impounding works are of a suitable nature to prevent the debris getting into the rivers.

The miners have always maintained that they could build such works and the antidebris men have maintained to the contrary. This time the judge personally inspected the impounding works and pronounces them satisfactory. This will be a bitter pill to the little clique of antidebris men who are trying again to start an organized opposition to hydraulic-mining in this State. They are organizing to prevent dams being built anywhere; but the same court which stopped hydraulic-mining now legalizes it under certain conditions, and says that dams will accomplish the object the miners have always claimed they would.

This is a distinct and decided legal victory for the hydraulic-mining interests of California. It is, moreover, in line with popular opinion and with the views of the Legislature of California and of the Congress of the United States. For years the miners have been fighting for permission to build and use these dams, but until now the decisions have been against them. In this instance it was not a debris association but the Government which is defeated, and the miners are given permission to go on with their work as long as they can keep their debris out of the navigable streams.

The immediate effect of this decision will be the application of other mines having impounding works, for permission to work. Moreover, other mining companies will build dams and arrange to commence operations. This decision will be a great card for the miners' side at the coming session of Congress, and will undoubtedly lead to the passage of the modified Caminetti bill by the Senate. The U. S. Engineers who reported that hydraulic-mining could not go on under decisions which made it illegal to discolor the river waters, will now find the rest of their opinions will be verified, that obstacle being removed by this judgment. That is to say, they could see no way of getting over that particular objection, but it being removed, they saw a way to permit mining to be resumed. It is now legally removed, and under the specified conditions mining can go on.

It should be a general subject of congratulation to the people of this State that the U. S. courts, anticipating the action of Congress and agreeing with the opinions of the U. S. engineers, should see a way by which the largest hydraulic mine in California can again be worked. We need the new gold from all these mines, and if a way can be found for one to legally work, the same means may be adopted by all.

Mathey's Tin-Smelting Furnace.

At the Temescal tin mines of the San Jacinto Estate, Limited, San Bernardino county, this State, during the past 18 months, they have been using a tin-smelting furnace patented by Henry Mathey, M. E., of this city, and in which oil is used as fuel instead of coal. Mr. S. Harris, the manager, states that the whole arrangement gave entire satisfaction. He is of the opinion that the construction of the furnace is of the best description and will eventually supersede the use of coal for smelting purposes in England. In the southern part of California petroleum is more abundant and cheaper than coal, and Mr. Mathey designed his furnace especially for use at the Temescal mines where the oil is easily obtained. Except in Cornwall, Great Britain, black tin is to-day, all over the world, smelted in blast-furnaces fired with charcoal or coke. The process is simple and the reduction easy, but the loss is much greater than in the Cornwall process, which is not generally adopted elsewhere on account of the difficulty of obtaining coal of proper quality without paying an exorbitant price therefor. During the smelting of the tin-concentrates in both processes the loss by volatilization alone, caused by too high temperature at times (which is very difficult to control), and also excessive draft, is equal to nine per cent in the blast-furnace, but is somewhat less in the reverberatory furnace. Another loss of from four to six per cent is caused by the excessive heat forming a vitreous slag which contains small globules of tin and particles of cassiterite, which are very difficult to recover.

Mr. Mathey designed his furnace with the idea of reducing the loss from these two causes (excessive heat and draught) to a minimum. The accompanying drawings show the furnace in use at Temescal, and which accomplished these results. One is a sectional elevation and the other a plan (inside). It will be seen that in effect the invention comprises the combination of a hydrocarbon burner and a suitable deflecting-roof arranged to receive the flame from the burner and direct the heat downward upon the charge to be smelted. The reverberatory furnace has its chamber narrowed by diagonally arranged walls at the end opposite to that at which the flame is introduced, and it is provided with two or more draft-flues, opening, respectively, from the chamber through this diagonal wall.

The ore is placed upon the iron floor and mixed with an addition of about 20 per cent of its weight of crushed coal. The oil-burners extend into the furnace from the front through the openings provided in the door-front. The burner is so arranged that it may be raised or depressed to direct the flame into the proper position for obtaining the best results. The burners may be of any of the well-known forms in successful operation, and do not require description here. The adjustment of the burner required to direct the flame so as to secure the best results is very slight, the object being to prevent draft upon the surface of the charge and consequent carrying away of the fine particles of cassiterite and tin.

The heat is reflected from the reflecting-roof, and thus operates to smelt the ore, with a scarcely perceptible loss from volatilization. Sometimes, when an extra heavy charge of ore is introduced and the surface thereof is elevated above the usual plane occupied by the surface of a charge, the lower portion of the flame from the burner may be thus brought so near the surface of the charge as to produce a draft. In such cases the burner is elevated by a hand-wheel sufficiently to remedy this difficulty. The ventilating-doors are hinged to the top of the door-frames, and are provided with isinglass-covered openings for observation. The doors are adjustable, to admit the proper quantity of air to the furnace.

In the rear of the furnace, in place of one central aperture communicating with the flue, two are provided—one on each side of the rear of the furnace—each opening into the main flue through short intermediate flues arranged diagonal to the flame so that the draft will not be so direct. In reverberatory furnaces as usually constructed, there is difficulty in securing equal distribution of the heat to all parts of the chamber, on account of the central flue causing a central concentration of the draft. By Mr. Mathey's arrangement of the flues, the heat is equally distributed on each side of the chamber, and superior results obtained thereby.

In working this furnace the oil burners are lighted and the furnace heated to the desired degree. The charge of ore and crushed coal is introduced into the chamber and properly distributed about the floor by a suitable implement. The burners are regulated to direct the flame at the proper point between the charge and the crown of the arch. The ventilating doors are opened sufficiently to admit the air necessary for perfect combustion, and when once regulated there is no occasion to disturb the doors until the reduction is complete. The amount of oil admitted to the burner is regulated from the exterior of the furnace and can be increased or diminished as desired. When the reduction is completed the slag is discharged through the proper opening, and on removing the clay-plug the metal flows off into the receptacle placed to receive it. It is then taken out by means of ladles and poured into the mould.

It is obvious that this improved furnace may be applied to various other uses besides the reduction of tin ores, but it is especially adapted for them. As stated, it has given satisfaction at Temescal, where it has reduced the ores from the mine in a thorough manner. Mr. Mathey has appointed as his agent for this furnace Mr. H. J. Summerhayes, successor to Adams & Carter, 132 Market street, in this city. No description of this furnace has heretofore been published because the patent has only just been issued.

Coast Industrial Notes.

THE Corralitos Water Company's system, including the electric-light plant, has been offered to the town of Watsonville for $150,000.

RICHARDSON BROTHERS' steam wagon, which runs over common dirt roads, hauls from 30,000 to 35,000 feet of lumber daily up at Truckee.

COMMENCING on October 7th, the rate on lead bullion from Utah common points to San Francisco, Stege and Vallejo Junction will be $10.25 a ton, instead of $11 as heretofore.

CONTRACTOR ROBERTS has about 60 men at work on the East Side canal. The canal has been completed from the railroad to the schoolhouse in Sumner, Kern Co. One mile of the canal through Sumner has been cut 2½ feet.

THE several applications for electric motive power franchises were rejected by the San Jose City Council on Monday, as the city exacted that the main supply wires be placed underground, which the companies refused to do.

A NUMBER of property owners on eighth street Oakland have filed a protest with the City Council against granting a franchise to McNear and others to run an electric road along that street between Grove and Franklin. The poles for the proposed road are already in place.

THE Pacific Construction Company will soon commence work in the main line sewer in South Berkeley. The attorney for the company finds that the annexation is legal. The company has put up a bond of $5000 to do the work. The contract price for the sewer is $15 000.

AT Volcano, Amador Co., Mr. Young, a miner, has put up an engine of three horsepower, which he runs with 30 cents worth of gasoline per day. It pumps out part of the south branch of Sutter creek, where the bedrock is very deep, and is supposed to be lined with gold.

GEO A. HARE, of Washington township, has applied to the supervisors for a franchise to construct a railroad between Grass Valley and Nevada City for the purpose of conveying passengers and freight between the two towns. The supervisors have the matter under advisement.

CONTRACTOR GRAHAM, who built the first section of the Lower California railroad last year, says he has the contract for another 50-mile section, and will begin work in December or when the rains come to give water along the line. This contract will complete the road from San Quintin to Colnett.

THE Austin, (Nev.), Reville says, that Superintendent Bray, of the Big Creek antimony mine, after many months of dead work, has put his force of men extracting ore. The first shipment of many months, of 90 tons, has just been made, and if the price of the metal will justify, large shipments will be made frequently.

PLANS are being prepared to be submitted to the Navy Department for the long-talked-of bridge across the Mare Island straits to Vallejo. In addition to these plans, others will be submitted for a large ferry-boat to be run at Government expense. It is, of course, not known which plan will meet the approval of those having the matter in charge.

THE receipts of quicksilver in September in this city, amounted to 1762 flasks. For the past nine months there were 13 978 flasks received, as against 10,581 flasks for the same period in 1891, and 9238 flasks in 1890. The exports for the first nine months of 1892 amounted to 16,844 flasks, against 3213 flasks in 1891, and 8811 flasks in 1890.

THE track of the Mexican International railway was completed to the depot at Durango on Sunday in the presence of 15,000 people, assembled on invitation of Contractor Robertson. The last three ties, decorated in Mexican and American colors, were laid, and the spikes driven by Governor Don Juan Manuel Flores and several other prominent Mexicans.

ON MONDAY the last installment of $10.600 was paid by the Oakland, Alameda and Piedmont Railway Company for the purchase of the Meetz road to Alameda. Already a track has been built from the Twenty-third avenue station over the new steel bridge to Park street and Santa Clara avenue. A new powerhouse will be constructed where the present carhouse stands.

THE Directors of the San Francisco and Atlantic Railway have filed with the County Clerk a certificate of the creation of a $20,000,000 bonded indebtedness for the purpose of locating and constructing a railrord between this city and Los Angeles, via the San Joaquin valley. The Directors of the enterprise are R. T. Harding, Frederick Horner, Lyman C. Parke, Green Majors and A. Judson.

THE new schooner, Prosper, of 224 tons net, which arrived Monday from Coquille river on her first trip, is built on an entirely new model from vessels in the coasting trade. She was designed as a light draught boat purposely to cross the Coquille river bar, which is very shoal at low water. She also operates two centerboards, one forward and the other aft. The schooner has a carrying capacity of 275 000 feet of lumber.

DURING the past two months the building operations in San Jose have been exceptionally lively and are significant of the fact that business men are confident that the city will support many more business houses than it has at present. The increased demand for carpenters and masons has caused many workmen from other places to come to San Jose for employment, and as a result there are more mechanics in town than needed.

FROM County Assessor Feudenthal's report to the State Board of Assessors and Equalization, the Pioche Record Lincoln Co., Nev.) finds that for the year 1892, 13,064 tons,)and 237 pounds of ore gave a gross yield of $359,507.73 and for 1891 10,368 tons and 1674 pounds of ore gave a gross yield of $276,765.57, being an increase of 2695 tons and 613 pounds, of the value of $79,742.16. The mining industry compared with the agricultural shows the sum of $190,087.13 in favor of the mines; the value of the agricultural products being $166,420 and that of the ore from the mines $356,507 73

BIDS to the San Francisco supervisors for the construction of a steel drawbridge over Channel street at Fourth were received as follows: P. McMahon & Sons $23.850, for old material $50; San Francisco Bridge Co. $30,387, old material $750; Coppman Brothers & Co. $28,842, old material $500; Healy Tibbets & Co. $28 465; McCann & McKay $25,690, old material $100; James J. Searle $26,300, old material $100. A resolution of award to McMahon & Sons was passed to print and the resolution referred to the street committee.

THE last rails on the Bakersfield and San Miguel R. R, connecting with Asphalto, were laid last week The men are now ballasting. Asphalto is 49 miles from Bakersfield. The completion of this road marks the enlargement of what is to be one of the most material interests of Kern—the oil and asphalt industry. The road to market is now at their very doors and prosperity is sure to attend them. Stevens station, 16 miles from Bakersfield, will be the shipping point for the oil, asphalt, sulphur, kaolin and other minerals of the Hazelton (Sunset) district, as well as of the lands to the south, and the junction point of oil pipe lines from that district. The Buena Vista Reservoir railroad, with its 12 miles of road completed, needs only 10 miles to form a connection with this branch of the world. Everything argues in favor of the completion of this branch, as, independent of the large freight in oil, asphalt and minerals to come over it, the cattle, wool, sheep, grain and hay of the San Emigdio, La Carissa and other grants will find thence a convenient outlet.

Personal.

MR. C. H. AARON is off on a professional trip to El Dorado county.

ISAAC KLOPP of Granite, Oregon, reports the placer-mining season just closed as a good one. The outlook of Granite is favorable.

J. P. CURRIER, of the firm of Carlson & Currier, will start the new silk factory in Petaluma Jan. 1, 1893, removing there from this city.

THE Oakland City Council has disposed of the idea of an electric road on Harrison street, both the Alsip and Davie ordinances having been defeated.

MESSRS. F. WUNDER AND E. W. MEIER have made some good locations at Bald Mountain, Oregon, 18 miles south of Baker City, at the head of Stices gulch.

A NUMBER of W. W. Slater's new pneumatic signal bells, recently described in the MINING AND SCIENTIFIC PRESS, are being placed at railroad crossings in Oakland.

GEORGE MOORE, one of the owners of the Weatherby placers, Oregon, better known as the Chicken creek diggings, says that the output this season will be about $13,000.

A. B. PAUL, of Middle Creek, Shasta county, the cyanide process expert, has just returned from a visit to the Mercur mill, Utah, where the process is being worked successfully on a large scale.

PROF. JOSEPH LE CONTE, of the University of California, who has just returned from abroad, was banqueted by the Academic Senate of the University at the Palace hotel on Saturday evening.

IT is currently reported that a sale of the Truckee Lumber Company's vast property is likely to be consummated. Experts are investigating the property, and if reports are satisfactory a good offer will be made for the entire lands, stock and business.

A. J. ROULSTONE, of this city, who is an expert in constructing and operating copper-smelting furnaces, is at Stoddard, Arizona, where he has just completed the erection of a smelting plant for the Agua Fria Copper Co. The plant is working satisfactorily.

PROSPER L. E. HUERNE, civil engineer and architect, died in this city on Saturday. He was for some years local agent of the Panama Canal Co., and carried out large dredging contracts on that work, obtaining much of the machinery and supplies in this city.

WHEN Superintendent Slater of the Southern Pacific's electrical department advocated an auxiliary boiler for the ferry steamer Oakland's electrical plant, many of his superiors doubted its advantages over working steam from the main boiler. The scheme has, however, already proven the more economical of the two.

L. O. NELSON, secretary of the Baisley-Elkhorn mine, Oregon, has perfected arrangements for a mill to be placed on the property of the Elkhorn Mountain Gold Mining Co, which is located just above the Baisley-Elkhorn mine and which gives promise of being a valuable property. The mill machinery will be on the way to Baker City in a few days.

THE Colton Marble Works have just quarried the largest block of marble ever taken out in this State. When squared up it will be 15 feet long, 5 feet and 4 inches wide, 6 feet and 5 inches thick and weighs 25½ tons. It is to be cut up into marble slabs 14 feet long, 5 feet wide and 2 inches thick, and will be used in the telephone company's new building at Los Angeles. Another huge block of the same size is being quarried.

MR. OTTO VON GELDERN is surveying Petaluma creek with a view to its improvement by the U S. Engineers. All the measurements are made with considerable detail, so as to base upon them the probable cost of any future improvement. A thorough study will be made of Petaluma river, so as to lay an intelligible plan before those directly interested in its navigability. What those improvements will consist of cannot yet be stated; dredging, however, being the principal work that will be done on places indicated on a chart made by the engineer now in charge of the surveys. The work is under the direction of Major W. H. Heuer, U. S. Engineer.

The Mines of Sierra County.

From Our Traveling Correspondent.

GRASS VALLEY, October 1, 1892.

TO THE EDITOR:—For some years mining interests in Sierra county have been seriously depressed, more so, perhaps, than any other locality in the upper portion of the State. Sierra is primarily, in fact solely, with the exception of its one valley, a mining section. So, naturally, the forced idleness of its hydraulic mines, the exhaustion or suspension of its principal quartz properties and also of its greatest drift mines, have tended in no small degree to blacken the mining eye, as it were, of the county. In a way, it has followed simply the course of evolution of every mining section. It has had its splendid "ups," hut for a long time has had to struggle with a severe case of the "downs." Sierra, however, is not "entirely dead." While there is a prevailing and infectious complaint of dullness, a lack of large-scale operations, and a prayer generally for a change, there is still more cause for hopefulness for mining interests as a whole than there bas been in years. The last year, and particularly the present season, has noted the turn for the better. In many places new men and new capital have come in and recommenced the work of development. It is believed—and everything seems to favor the belief—that there are just as rich mines still unexplored as those were that are now pronounced worked out.

The gravel mines may be said to be the operating and paying mines of the county at present. For quartz there is a flattering outlonk. But, with one or two exceptions where an old mine is working in a desultory manner, quartz properties are still in the state of a prospect, though only a few months more are necessary in several cases to raise these prospects to the dignity of a mine worthy of the days of Sierra county quartz mines.

WESTERN SIERRA AND HYDRAULIC MINING. — The vicinity of Scales, Port Wine, St. Louis, Gibsonville and Howland Flat has been particularly a hydraulicking locality. Consequently the prohibition of hydraulic mining wrought severe injary aad cut off an annual output, it is estimated, of nearly $2,000,000. As these claims were small ones and numerous, representing many individual owners and giving occupation to a great many men, it can be seen how immense the loss was. The result has been, not only depression, but depopulation. Where there were once 50 men there is now scarcely one; and the only reason this one is still here is because, in many cases, he can't help himself. Hydraulicking was never prosecuted here on a grand scale. Banks were low, the water supply limited, and the amount of earth that would be washed in a season would scarcely equal that torn away in a single week's run of some of the great lower-cuuntry hydraulic mines, and which were the ones that caused such havoc to the rivers and valleys. Furthermore, by the nature of the country, the isolation, the character of the streams, and above all, the impounding methods adopted, hydraulicking might have continued here until this day without damage to the country below or to the navigable rivers. The dams in Slate creek were built at the expense of the mines operating thereon, and under the direction of Mr. Chas. Deisen of the once famous Pioneer mine, and they will stand, for a conservative estimate let us say, as long as most of the surrounding mountains. At least, their insured permanency surprised the U. S. Engineers and met with their unqualified approval. A gentleman, who for ten years was a Yuba county supervisor during the height of the hydraulic agitation, told me a short time ago that be never knew the time when the North Yuba, below the mouths o Canyon and Slate creeks, was not clear enough to drink from, sufficiently clear at least to show the amount of sediment carried was insignificant.

I have dwelt this long on this particular locality to show that some hydraulic mines may and have been worked withnut being a "public or a private nuisance." There are many other mines and localities where the foregoing facts will apply with equal force. Of places that I have seen, I would apply them particularly to Spanish creek, Plumas county. Here also, many rich mines are idle that should be allowed to work, and could without the slightest damage. That any one living in these places has actually been obliged to resume hydraulicking in spite of the law, in order to secure the barest livelihood, is heartily poohpoohed by the opponents of the hydraulic system. The miner, naturally, will paint his own social picture in morbid colors, but there is far more truth in it than those who laugh without knowing what they laugh about will allow, or even the outside world is aware of. Despite the apparently successful progress toward resumption, miners generally are not unduly hopeful. The old men feel that the fight belongs to the younger generation, and that they will not be the ones to profit by later and intelligent legislation.

The fight has not been given up by any means, as will be shown by the assembling of the Miners' Convention in November, when each county will be represented by its full quota of delegates. Such are the intentions of Plumas, Sierra and Nevada counties at least. The latter is already prepared to send over 100 men, and the other counties are not far behind. To bring their cause before the whole body of the people is the object of these miners, and the time has certainly come when they must and will attract attention and gain notice through the daily press without having pay demanded for the privilege. The earnestness and popularity of this movement is in grand contrast to the weakening cause of the antidebris alarmists. A little instance may he cited here of the views of the latter on the question:

One day, not long since, a valley farmer living near Biggs, and possessed of some 2000 acres or more, and seemingly also of considerable intelligence, remarked to me in regard to hydraulicking, that he was not opposed to it if it can be prosecuted strictly within the limitations of Judge Sawyer's decision; but as he did not believe that possible, as a shovelful of dirt even thrown into a stream would contaminate it and become a "public and private nuisance," he further believed it would be the best thing in the world if drift mines and all were closed down, as *mining was but a barbarous institution anyhow*! Verily there is much truth in the story of the drowning man and the straw. My friend is not ordinarily considered a crank, but a conservative and thoughtful man and a lenient follower of Mr. Green. In quoting him, I have given him full justice, and were it not for the fact that I have met many other prominent and honest farmers who hold like marvelous views, his opinion would amount to little.

Fortunately for the world, the country at large, and this section in particular, the prosecution of mining is not dependent entirely on the good-will of our valley friends or the hydraulic system. There are many mines, representing an outlay of hundreds of thousands of dollars, that can be profitably worked in no way except by hydraulicking, and the capital here invested cannot be diverted to other channels because it is unavailahle for any other purpose. Where it has been possible, owing to favorable properties and sufficient capital, some old hydraulic mines have been converted into drift mines, but these are few and in no case have they as yet assumed important proportions.

THE PIONEER MINE, at Grass Flat, two miles north of Port Wine, is principal among this class. Work has been going on for the past two years and a tunnel of 1000 feet has been run. Little work has been done this season, as the mouth of the tunnel has been partially closed by slides which caused considerable trouble during the spring. This mine was immensely rich as a hydraulic, and bids fair to continue as a converted drift mine. Chas. Deisen is superintendent.

THE RIFFLE, managed and owned principally by Wm. Prosser, is another once prolific hydraulic mine, and lies below and near the Pioneer. This has been developed by a 2000-foot tunnel.

THE CHALLENGE MINE of the Treasure Bros., adjoining, is now working under a five years' bond by Mr. Wheaton of S. F. There are 2000 feet of main tunnel. A south side drift of about 200 feet this season has given splendid prospects for large developments. All these mines are reaching out for the Port Wine ridge channel. Their workings are generally eastward. However, it is not on these mines that the district is dependent for present support.

THE UNION, or, as is more generally known, the Happy Hollow mine, two miles northeast of Port Wine, taps the ridge from the Canyon creek side. It is a very old mine and in times past has paid richly. The channel is approached by a tunnel 2000 feet long, through hard bedrock. Thirteen hundred feet has been run in the gravel. In places the channel showed a width of 900 feet. When I visited it, a few weeks ago, the wnrk of "drawing out" the gravel pillars was in progress, and when that is done the future of tbe mine is uncertain. At present it is owned by a London company, and since March has been under the superintendence of G. W. Miller. A year ago, 150 men were employed, but only about one-third that numher is now working. That the receipts of the mine have been satisfactory the past season may be judged from the fact that since February $35,000 indebtedness has been lifted, consisting of liens filed on the property, all operating expenses met and still leaving a large surplus. This certainly speaks well for the present management.

THE SUFFOLK.—This mine is a mile north of the Hollow, at Wahoo, and on the same ridge. Owned by the Thistle Shaft Corporation, it has been worked for three years past on a lease by Messrs. David Moore, superintendent, and Chapman of S. F. Three thousand feet of tunnel, mostly in the bedrock, have been run. At present, work is going on in a north drift, 800 feet in. With the ground pitching, and sufficient pay gravel to meet expenses, Mr. Moore expressed himself satisfied with the outlook. About 30 men are employed.

THISTLE SHAFT, on the Gibsonville ridge and two miles below the town of Gibsonville, is the largest and one of the best-paying drift mines in the county. It is owned and operated by the Thistle Fork Gold Gravel Company, a Scotch corporation of immense and varied mining holdings. Mr. C. B. Wingate is managing superintendent. Operations have been going on here for the past two years and a half. This mine differs from nearly every other drift mine in the county, and in the State for that matter, in that all operations are carried on through a shaft instead of through a tunnel. In a district where water is as plentiful as it is here, and where the nature of the ground permits an approach to the gravel channel at most any depth required, it has often appeared strange to those accustomed to the ordinary method why this same method was not followed. Mr. Wingate states, however, that the company does not repent of its action, but is well satisfied. Four steam-pumps have no trouble in handling the water and the mine is kept remarkably dry. The shaft—triple compartment—is down 470 feet, to the bottom of the channel. From its foot 3000 feet of tunnels and gangways have been driven, and they are now working 1400 feet in. Five hundred feet in from the main shaft an escape shaft has been sunk to give further safety to the men and afford ventilation. Thus far the work has been mostly of a prospecting nature, but already it has shown such development as to prove that it is one of the big and paying mines. The gold extracted is of very fine character, both for size and quality.

The geological formation about St. Louis, Gibsonville and Howland Flat has of late started prospectors in a new and hitherto unexplored field. Thr nature of the gravel of the old hydraulic basin is that of washed and rounded quartz, pebhles and boulders. Frequently these have been found rich in gold.

Two broad helts of serpentine traverse the country, and running parallel with these, in a direction generally northwest and southeast, are numerous quartz ledges. Below this formation lie the auriferous deposits. It has previously been held by some geologists that this gravel was brought in by glacial agency from some unknown and perhaps distant quarter; but the foregoing evidence seem to disprove such belief.

It is only within the past few months that attention has been seriously attracted to these lodes. Interest once created, though, is steadily on the increase, and lately a number of locations have been made, as good prospects have been obtained in many cases. In speaking of quartz, F. G. Onkin of Strawberry valley is developing a promising ledge, known in early days as the Eagleville ledge. At one time there was an 8-stamp mill on the property, but the chute of ore becoming exhausted and dissensions arising among the owners, it was abandoned. A new chute has lately been found and a 5-stamp mill is to be erected.

I will continue my description of the mines of this county in another letter. CHAS. E. TOWNSEND.

Some Claims in Nye County, Nevada.

SUTTER CITY, SUTTER CO, CAL, Oct. 1, 1892.

TO THE EDITOR:—Having noticed in a recent issue of your valuable journal that you want to hear from mines in smaller camps and thus assist in the sale of undeveloped mining properties whose owners are not in a position to bring them to the attention of probable investors, I take the liberty to write you concerning some mines in which I am interested. The mines are ten in number and are situated in Nye county, Nevada. They are 54 miles from the narrow-gauge railroad at Leadly and 40 miles from Luning on the Carson and Colorado road. There are four mines in one group and six in the other, the two groups being four miles apart. There is a small valley between the two groups, and with reduction works in the valley the ore from all the mines would go down hill. The mines have been well prospected and the product is all smelting ore. It contains gold, silver and lead. Some of it runs $24 gold per ton and 260 ounces of silver. The balance runs from $40 to $50 per ton. There is plenty of timber, and water would have to be piped about two miles. There is an easy grade from either group of mines down to the valley. The mines belong to the estate of Alfred Welch, deceased, in which I am interested, and being so situated that I cannot develop them I would like to find some one to take hold of them, as I am sure if properly developed they are a valuable property. J. W. WELCH.

Asphaltum Deposits in South America

Asphaltum exists in great abundance near the Pedernales river, an estuary of the Orinoco, opening into the Gulf of Paria, where petroleum wells have been sunk with good results, and a company has been organized in Caracas to work the property. The machinery is on the spot and in process of erection. Inexhaustible mines of mineral pitch also exist near Maracaibo, Merida and Coro. Petroleum wells are abundant in Cumana and Trujillo. On the island of Pedernales, which is formed by the two delta streams, the Cucirina and the Pedernales, its northern shore being that of the Gulf of Paria, is found a vast supply of asphaltum. The land is low, intersected by small streams, and containing many ponds of salt and brackish water. In such ponds on the northern shore is found the asphaltum known as Pedernales asphalt. This differs in the main from that found at La Brea in Trinidad, in being generally more liquid, purer and freer from earthy matter, and in containing a greater percentage of oils. Like the deposit at Trinidad, this is found in a series of springs in conjunction with water, and, as at Trinidad, it forms a thick flooring of pitch in places, and to an appreciable depth. The Pedernales asphalt is remarkahly pure, and when refined, presents a hard, lustrous, vitreous fracture, and in appearance is identical with the Egyptian refined, known in trade as "Epure." As found it is a thick, black, viscous mass, without odor, and strongly adherent. The process of refioing consists in merely boiling it, thus depriving it of a large proportion of the higher volatiles and all contained mniture. Refining may be carried on to any degree, even to the extent of complete reorganization. The deposits at Pedernales may be said to be the same, geographically considered, as that of La Brea, notwithstanding that the Trinidad contains a quantity of earthy matter, well nigh inseparable, although mechanically mixed. These earths are mainly very finely divided clays, held in suspension by the viscous asphaltum. The presence of these impurities adds largely to the weight, and, while proving little detriment to the many uses of the material, debars it from many other purposes. The Pedernales deposit can be used for any purposes known in the art, and is as desirable for varnishes and chemical compounds as it is useful in increasing the elasticity of the asphalt, which contains too small a percentage of volatiles. The Pedernales asphalt can be refined to order, thus exactly fulfilling desired conditions imposed by users.—American Manufacturer.

AN organization is being perfected in Lakeport and vicinity for the construction of an electric railway from the Donohoe railroad to Lakeport. The company is called the Clear Lake and Russian River Railroad Company. The Board of Directors elected are W. J. Biggerstaff, F. W. Gibson, R. W. Crump, J. K. Fraser, W. B. Collier, H. C. Boggs, and D. W. White. D. W. White was chosen Treasurer. The capital stock of the corporation is $300,000. As sooon as the organization is completed it is proposed to go vigorously to work and secure enough of stock and subsidy subscriptions from the people of Lake county to induce capital to take hold of the enterprise. This can be done and Lake county can have a railroad within the next few months if the people want it. The county is now very much isolated, as long stage rides are necessary to enter it. Tourists do not now visit Lake county in any number, but would do so were there proper means of transportation. The region will be a favorite one for summer visitors as soon as they can get to Clear Lake by rail.

The Cyanide Process.

Remarks on the Discussion of Its Novelty.

TO THE EDITOR:—I am not a partisan of "the MacArthur crowd," whose "ooisy claims" fatigue me as much as they can Prof. Morton; yet, in the ioterest of candor and good faith, I must protest against the implication, which I have heard often, and which appears in Mr. Morton's article in your issue of 24th iost., that the process of extracting or dissolviog gold and silver from ores by means of potassium cyaoide was anticipated in any process of electiogilding or electrnplating. I also object to this implication because I think it weakens rather than strengthens the case against the "noisy claims" and exorhitaot charges of the patentees.

I hear aod read frequeotly that the knowledge of the soluhility of gold io aqueous cyanides is not new, and that is true, hut the evidence usually advaoced in proof is utterly fallacious and would he upset in very short order by any pateot lawyer. The solutioos of gold used hy electroplaters are oot made hy dissolving gold in aqueous cyanide; that would he too slow a process; they are prepared hy dissolving a *compound* of gold io that menstruum, and, during the electrogilding, the strength of the solution is maintained, oot hy the slow actioo of potassium cyanide, hut hy cyaoogen, which, in the ahsence of gold or any other metal with which it could cnmhine, would either he set free on the positive electrode or would form some compound with the constitueots of the hath, I confess that I do not know which. This cyanogen is the chemical equivalent of the gold which is deposited on the oegative electrode. There may, perhaps I may say must, also he a slow dissolving nf gold hy the ordinary action of the solution on metallic gold, hut that is of oo practical account in the operation; it is the action of the electrical current which releases gold from its union with cyanogeo on the ooe electrode, and simultaneously causes a combioation of gold with cyanogen at the other electrode.

Io electrogilding, the solutioo of cyanide of potassium serves merely as a solveot menstruum to keep in solution the otherwise hardly soluhle metal cyaoide which is the real electrolyte to be decompounded at one pole and recompounded at the other *simultaneously*. In this hattle of the forces, the potassium is not a priocipal, hut only a second; it does not combine with oxygen, as wheo gold dissolves, independently of precipitation, io aqueous cyaoides, and it needs no reeoforcement hy addition of fresh cyaoide of potassium except as it may gradually hecome oxidized through atmospheric action and other suhsidiary effects. So different is all this from simply dissolving gold in aqueous cyanide that I do not hesitate to affirm that a process of electrolytic solution (with simultaneous precipitation) of the precious metal in ores, whether using aqueous cyanide or any other liquid as a medium, and the cyaoides or any other compounds of the metals as electrolyte, would he eotirely clear of "the noisy claims of the MacArthur crowd," and if it could not he pateoted, that would not he on account of those claims, nor even hecause of the prior practice of electrogilding, hut hecause that *same thing* had heen dooe hefore, io the same menstruum and with the same electrolyte. As a matter of fact, ores have heeo worked hy electrolysis, and I helieve the chief difficulty has heen that hase as well as precious metals were extracted.

The operation of electrogildiog does oot prove that metallic gold cao he dissolved hy a solutioo of potassium cyanide without the aid of an electric current from an extraneous source. Metallic gold cannot he dissolved, to any appreciable extent, hy a solution of common salt, with or without access of air, apparently hecause chlorine is a more negative suhstance than cyanogen, aod it clings with more tenacity to the positive potassium; or, perhaps, it is hecause gold lies much nearer to the extreme positive eod of the scale when in cootact with a cyanide solution thao wheo in contact with a chloride. Similarly, hydrogeo-chloride will oot act sensihly on metallic gold *per se*, yet, under the influence of the electric current, gold dissolves and simultaneously precipitates in either one of the liquids oamed. It is, however, a fact that metallic gold can he dissolved hy means of a solutioo of potassium cyanide, without the use of a curreot, and this fact seems to have heen widely koown loog hefore MacArthur made use of it. I proved it myself, experimentally, ahout 1879, simply for verification of what I had read. But, hetweeo dissolviog gold in a heaker, on the scale of a chemical experiment, and extracting gold on a commercial scale from pyrite or other matrix, there is a distioct difference, which the patent office recognizes; it therefore hehooves those who would cast a douht on the validity of a pateot on the latter to show that *that* was done before. I hope some ooe will do so in ao uoequivocal manoer.

In regard to patents on metallurgical processes, I occupy a position somewhat analogous to that of the Irishman who was "agin the Goverooment anyway;" at least I want to know or helieve that a patentee deserves to he one hefore yielding my assent (a matter of small importance, however). I have thought and said that, eveo though the cyaoide process for ores may he as old as is claimed hy some, yet, ioasmuch as it was not in use aoywhere io recent times and is oot described in the modern staodard works on metallurgy, was not eveo known to maoy ahle eogioeers and metallurgists, the "MacArthur crowd" might well he coosidered deserviog of some compensation for hriogiog the process to our notice lo a practical working form. But have they done this? I hear of hut two places in America where success is *claimed*, aod I hear of many ailures. I hear of large sums of mooey heing paid (or promised) for rights, and I have not heard that the sellers of rights have made any effort to secure or promote the success of their clients.

The royalty demanded on this process is excessive in the case of low-grade ores. If a party must pay ten or fifteen thoosaod dollars for a district, and then pay ooe dollar for each ton of ore treated, he must charge *his* licensees more than one dollar per ton, or lose mooey; this is a heavy addition to the cost of working low-grade ores, aod if persisted io will not only restrict the use of the process, hut will stimulate rebellion against what seems to me to be a flimsy perogative at hest.

One of these days I may have something to say ahout the patents as puhlished io this paper on July 2d, unless this article should have the effect of eliciting a hetter argument thao that hased on electrogilding. In the meantime can aoy chemist or physicist tell us if there has ever heeo offered an explanatioo of the curious fact which the discussion of this process brings into unusual promineoce? I refer to the alteratioo of the electrochemical relations of hodies, in some iostances amounting to reversal, hy a simple change of the surrounding medium. Why, for instaoce, is gold oegative to quicksilver, in most solutions, and positive to it in a solution of a cyanide? C. H. AARON.

Shasta County.

The Scherer Group of Mines.

REDDING, Octoher 1, 1892.

TO THE EDITOR:—It is now seven years since the discovery, in this county, of a veio containing free gold, tellurides and sulphurets upon the Scherer property. The Eureka ledge was the first discovered. An incline shaft was sunk for 98 feet aloog the vein; a vertical shaft was then sunk for 75 feet, from which a crosscut tunnel was ruo to strike the ledge. This tunnel, when run for 35 feet, encountered a fault, hut a drift of 15 feet to the east showed the lead very stroog and 5 feet thick. It was in this drift that the large quantity of free gold was found that first attracted atteotion to the mine. The direction of the veio is slighily east of north, with ao easterly dip of 30 degrees. With a view to further developing the property, a tunnel has lately heen driven from the side of the hill, just ahove Salt creek, for a distance of 700 feet, with a dritt of 65 feet and an upraise of 30 feet. The general formation is a chloritic slate. The hangiog-wall is free, with marked evidence in some places of a slide. In the footwall there are spots frozen to the quartz, hut a clear gouge ohtains for the greater distaoce. Io a few places the quartz appears to he intermixed with the slate.

Adjoiniog the Eureka tellurium mine on the south side, and having a parallel directioo, lies the Hidden Treasury, as yet undeveloped. The Cleveland comes oext, 800 feet southerly from the Eureka, and also a parallel veio. This mine has heeo rapidly developed, and promises to he a very valuahle addition to the company's property. Work has heen commeoced upon it during the present year. The vein has an easterly dip at an angle of 60 degrees and averages 4½ feet wide. A shaft 6 feet in width has heen sunk to the depth of 98 feet. There is a clear gouge of 6 ioches on the footwall and 10 inches on the haoging-wall. A tunnel is being driven to crosscut the vein, and is now in 90 feet and has already crosscut two small veins—one 10 inches, the other 6 inches—hoth giving good assays. This tunnel is 150 feet helow the shaft and 250 feet below the summit. Five hundred feet southerly from the Cleveland, we come to the Shaefer. This mine was discovered five years ago. The course of the vein is northeast and southwest. The croppings are wide; a prospect shaft has heen sunk for a depth of 40 feet, showing a well defined ledge 3½ feet wide with an easterly dip of 65 degrees. Twelve hundred feet south of the Shaefer is the Herhert. This vein ruos northwest aod southeast, with an easterly dip of 75 degrees. Upon this vein a shaft has beeo sunk for a distance of 18 feet that shows that the average width is 10 feet as far as prospected. The Golden Rod and other ledges are also on the Scherer property. The title is good, as it is on an old Spanish grant.

A tramway with steel rails is oow io course of coostruction. It will he 2000 feet long, coonecting the Herhert, Schaefer, Cleveland and Eureka mioes. The engine is 35 h. p. with all late improvemeots; a concrete floor has heen laid in the engine-house. A separate engioe drives the fao for the tunoel. Two Phœoix air-compressor drills have heen used. The Cleveland tuonel is, however, heiog driven hy hand, hut it is Mr. Scherer's intention to have electric power from the works io Redding, which place is only three miles distant.

Middle Creek station, on the Califoroia & Oregon R. R, is only a few hundred yards distaot from the proposed millsite, which will he almost directly opposite the tunnel of the Eureka mine. Mr. E. W. Harlow has lately made some assays of the several mioes, having heen hrought from Oakland to examine the company's property. The following results were ohtained under the ohservation of the writer. The tests were made to ascertain the value of the ore in the newly-opened Cleveland mioe:

No. 1. Sulphurets of Cleveland mine, amalgamated without nitrate, yielded per ton $5184.44. This was so surprisiog to those present that a secood cupellation was resorted to; the result was unchaoged.

No. 2. Sulphurets of Cleveland mine amalgamated hy nitrate process, $1748.76 per too.

No. 3. Tellurium slate sulphurets from refuse oo dump, after nitrate process, $3 per ton.

No. 4. Free gold from two pouods of Cleveland ore, $85 26 per too.

No. 5. Seven pounds of promiscuous ore taken from the Eureka tellurium claim, $40.30 per ton.

A large number of other tests was made, the object heing to determine the accurate commercial value of the Cleveland ore, with the result of giviog ao average of $65 per ton. WM. GREGORY HODSON.

AN important strike has been made on the 2000-foot level of the Empire mine, Grass Valley. The Empire is the oldest mine in the State now working.

THE Centeonial, a Nevada Co., Cal., gravel mine, owned hy Comstock men, now has its main tunnel in 2500 feet.

Results of Irrigation.

WASHINGTON, Sept. 15, 1892.—The Bulletin of the Census Bureau, just issued regardiog irrigatioo in the arid States and Terriiorles of the West, cootains ioformatioo likely to he of value to business meo interested in land enterprises in that section of the country. It would appear that the results of irrigatioo have heen reasooahly satisfactory and that the irrigated lands have paid a fair profit. Of the 124 808 farms enumerated in the arid regiop in June, 1890, 52,584, or 42.13 per ceot, cootained land on which crops were raised in 1889 hy the artificial application of water, the entire area of land irrigated heing 3 564.416 acres—20 72 per cent of the total area of the 52.584 irrigated farms, 9.66 per cent of the total area of the whole number of farms enumerated, and ahout one-half of ooe per cent of the total land area of the arid region. To this must he added 1552 farms, containing 66,965 acres irrigated, in the western parts of North Dakota, South Dakota, Nehraska, Kansas and Texas, designated, for convenience, the suhhumid regioo, where irrigatioo is slowly making its way, as a method of agriculture always advantageous hut oot always absolutely necessary.

The average value of the land irrigated io 1889, with the improvements thereon, is found to he $83.28 per acre, and the average value of products for the year stated $14 89 per acre. By correspoodeoce with over 20,000 irrigators, fairly distrihuted through the arid and suhhumid regions, it has heen ascertained that the average first cost of irrigation is $8.15 per acre, aod the average value placed upon the water rights, where separahle from the land, $26 per acre, or over three times their origioal cost. The average annual expenditure for water, as distinguished from the purchase of water rights, is $1.07 per acre, and the average cost of the origioal preparation of the ground for cultivatioo, including the purchase of the laod at the Government rate of $1.25 per acre, is $12.12 per acre. By applying, with necessary modifications, to the eoumerators' returns the average ohtaioed for each separate State and Territory, it has heeo found that, in rouod numhers, the total investmeot in productive irrigation systems utilized in 1889, in whole or in part, was, up to June 1, 1890, $29,611,000. Their value at that date was $94,412,000, showing ao apparent profit of $64,801,000, or 218.84 per cent. In the same manner the aggregate first cost of the irrigated areas, with their water rights, not iocluding the farms of the suhhumid States, has heen ascertained to he $77,490,000, and the value of the same on June 1, 1890, $296,850 000, showiog an increase io the value of land and water rights of $219,360,000, or 283 08 per cent. Io other words, the laod irrigated io 1889 was worth oearly four times what it cost, oo allowance evidently heing made for failures. The total expenditure for water, includiog the mainteoance and repairs of ditches, in the arid States in 1889 was $3,794,000, and the total value of products $53,057,000. The number of artesian wells used in irrigation in the arid aod suhhumid regions in June, 1890, was 3930, constructed at ao average cost per well of $245 58, aod giving an average discharge of 54.43 gallons per minute. The area of land thus irrigated, averaging 13.21 acres per well, amounted to 51,896 acres, or 1.43 per ceot of the total area of irrigated land in the arid and suhhumid regions.

The following table shows the exteot of irrigation in States and Territories in the arid region:

States and Territories.	Area irrigated, acres.	Per cent of entire land surface of State.	No. of farms enumerated.
Arizona	55 821	0.09	1,448
California	1,004 233	1.01	53 259
Colorado	890,735	1 34	16,505
Idaho	217,005	0 40	5,654
Montana	350,582	0.38	5,664
Nevada	224 403	0.32	1,341
New Mexico	91 745	0.12	4,174
Oregon (a)	177,944	0 39	10,513
Utah	263 473	0.60	10,757
Washington (b)	48 799	0.23	11,237
Wyoming	229,576	0.37	3 216
Totals	3,564,416	0 50	124,808

(a) 15 Eastern counties only.
(b) 13 Eastero counties only.

The following table shows the total approximate cost of productive irrigatioo systems and their value in 1890:

States aod Territories.	Cost.	Value in 1890.	Increase.
Arizona	$465,000	$828,000	$363,000
California	13 005,000	39,446,000	26 441,000
Colorado	6,359 000	25 350 000	18,981,000
Idaho	1,029,000	2,860,000	1,831.000
Montana	1,623,000	5,273,000	3 650,000
Nevada	1,251,000	3,714,000	2,463 000
New Mexico	512,000	1,679,000	1,167,000
Oregon	826,000	2,755,000	1,929 000
Utah	2,780,000	7,072 000	4,292,000
Washington	197 000	642 000	445 000
Wyoming	1,281,000	3,801,000	2,520,000
Suhhumid region	273,000	992,000	719,000
Totals	$29,611,000	$91,412,000	$64,801,000

The following table shows the first cost of irrigated areas, includiog water rights and their value in 1890:

States and Territories.	First cost.	Value June 1, '90.	Increase.
Arizona	$1,114,000	$3 2 4,000	$2,090,000
California	31,814 000	150,535,000	118 821,000
Colorado	16,140,000	59,595,000	43.555,000
Idaho	3,320,000	10 091,000	6,771,000
Montana	4,968,000	17,354,000	12,386 000
Nevada	3,905.000	9 200,000	5,295.000
New Mexico	1,701,000	4,677,000	2,975 000
Oregon	3.288.000	10,143,000	6,855,000
Utah	7,022 000	22,198,000	15,175,000
Washington	759 000	2,440,000	1 681,000
Wyoming	3,459,000	7,212 000	3,753,000
Totals	$77,490,000	$296,850,000	$219,360,000

J. H. RAE, Jr., Superintendent of the Carson River Nev. Placer Mioing and Dredging Compaoy, has received advices from the East to make preparations for huilding a new hoat for dredging purposes, and he will prohahly leave in a short time to procure material in Sacramento or San Francisco for this work. It is understood that the company will put on a large clam-shell dredge this time, capahle of lifting 1,200 tons of material a day. The amalgamator now on hand will he used in connection with revolving screoes and concentrators, and nearly an entire new plant will he put in.

Mechanical Progress.

The Manufacture of Pool Balls.

The manufacture of pool balls is an industry of no minor importance in this country, and the method of making such is interesting. Formerly ivory was generally used in the manufacture of these balls, but of late years celluloid has sprung into use and is now employed almost exclusively. Balls made from the latter are more substantial and will wear out three or four sets of the ivory, and, furthermore, can be put upon the market much cheaper, in fact at less than one-quarter the cost of the latter. Another thing in favor of the celluloid spheres is their absolute unsusceptibility to atmospheric changes, whereas the ivory will shrink, swell and crack like wool under the same conditions.

Celluloid is, as is generally known, a composition of guncotton and camphor, and being naturally of a yellowish tint, for this use is whitened by the aid of zinc white. After the ingredients have been properly mingled with the aid of steam heat, the material is formed in blocks slightly larger than the balls to be made. That the balls may acquire the proper degree of hardness, these blocks are right here subjected to a pressure of 30 tons for each ball. The ball is formed from the block in a lathe, and to insure their being perfect spheres, an automatically operated knife, which cannot cut beyond a certain distance from the center of each ball, is employed.

Then comes the coloring. The first step in this process is to submerge the balls in vats of dyes, the parts not to be colored being protected by little cups of brass ingeniously fastened upon each sphere. In the plain balls of red, blue, green, purple or yellow only the round spot where the number is to go needs to be covered, but in the treatment of the striped balls the matter is not so easy. After they have been fished out of the pots the dyed balls are put on a lathe and made to revolve rapidly, while fine sandpaper is delicately applied, so as to smooth their surfaces. Then a keen knife, manipulated by hand, removes from them the thinnest conceivable shaving all over, which does not take off the color, because the dyes penetrate to a little depth Finally, sandpaper is again applied, and the balls are ready for the last process to which they must be subjected.

Then comes the varnishing and finishing. The balls are placed for this purpose in little wire cups which come into contact with them at as few points as possible, and a transparent lacquer is bestowed upon them by hand. They are then dried and are ready for market. The numbers which appear upon the balls are produced by rubbing plumbago into the marks left by a dye which is applied and cuts the figures just before immersion in the dye vats. Whereas, if these balls, if cut into chips, would burn and shrivel up instantly, in solid form explosion or other like disaster is impossible owing to their density.—Manufacturers' Gazette.

Care of Tools.

One of the duties of the smith, as it is the duty of workmen in every department, is to keep his tools in order. The great trouble in the smith-shop is the battering of the heads of tools and faces of hammers. This battering is due to impact, which is a change of the molecules induced by heat generated by motion. The constant blows set the molecules in motion and cause crystallization, which is simply the forming of the molecules into crystals, which are the natural form of solids as the spherical is of liquids, and by this reformation of the molecules, their cohesive powers are weakened and the strength and resistance of the tool lessened. Steel hammers and sledges become crystallized in less than a year, from constant use, and chip off at the outer edges and sometimes inflict painful wounds. More than one such case has been recorded where chips from hammers have caused the loss of an eye, and where serious wounds have been the result of a careless failure to keep the hammers dressed up.

Hammers and sledges also become hollow on the face, from constant use and neglect, which not only unfits them for use, but makes them liable to split. They frequently split at the eye, which is caused by crystallization, and those which are fullered at each side of the eye frequently break at the fullered portion, causing more or less damage and injury.

Aside from the danger of this neglect, the quality of the work is lowered. Imperfect tools cause the twist in the iron when swaged and the uneveness of the fullering, and that in smoothing off a flat piece of iron, one side becomes thinner than the other, and so on to the end of the chapter, so that, besides being a safer way, it is a more economical way to have the tools kept in proper order. If there is anything that looks shiftless, it is a tool bench with tools all battered up. While it is, of course, utterly impossible to have the heads in the best condition when the tools are in constant use, there is no necessity for leaving them till they are battered way down to the eye and beyond all usefulness and hope of repair, when an occasional dressing and repairing would make them safer and more useful, and at the same time increase their durability. The thrifty workman will not allow this state of affairs to remain, and will find time to keep his tools in good order, however busy he may be; as he realizes that it pays to do it, and in reality saves time in the work. A workman who understands his tools and how they are made will understand how to do this, and needs no advice; but to the apprentice, any suggestions in every line that pertains to his labor are welcome, and in the future we hope to have something more to say on this subject.—Amesbury Vehicle.

ANCHORS.— In the manufacture of its own chains and anchors, the United States claims to secure results otherwise unobtainable on the score of strength and durability, even making its own iron, using nothing but the finest of malleable scraps, and the process is unique. The metal, says the New York *Sun*, as withdrawn from the furnace a glowing white mass, is rolled into long flat slabs of about one inch in thickness, which are cut up into short lengths, to be again subject to intense heat; these, being withdrawn, are rolled into billets of a few inches square at the ends and about two feet long, which are now for a third time thrust into the furnace, and at a white heat are taken out by means of large tongs suspended by a chain from an overhead trolley wheel, then rolled quickly into rods of various sizes and a number of feet long, being allowed to cool gradually in the air. The rods are now cut cold into short lengths for the links, which are formed by again heating and placing upon a special contrivance and turned into a staple shape, the staples being then linked together, completing the chain; the ends welded together by hand, the joining piece then put on, the link being then complete, so far as workmanship is concerned. To test the work, a long ditch running on one side of the shop is provided at one end with secure fastenings and at the other by a hydraulic engine, by means of which the chain is drawn tight and subjected to so many tons pressure; if, under this, a link breaks or exhibits any flaw, it is rejected.

OIL AS FUEL.—When the interest among the naval and stationary engineers is so continuously directed to the question of utilizing oil as a fuel under boiler furnaces, it is interesting to observe something of the relative economy, under favorable circumstances, of coal and oil. In New Jersey, in competition with anthracite slack and Westmoreland coal, it has been found that if the oil he at 2 4 cents per gallon, it would compete with coal at $3 95 per ton, at a test of a 6000 horsepower boiler plant. With coal at $3 10 per ton, and oil at 2.25 cents per gallon, the coal was cheaper; and where, in the coal district, that fuel could be got at $1.50 per ton, and oil at 1 5 cents per gallon, the oil cost one-third more than the coal. The theoretical evaporation of ordinary oil is about 21 pounds of water per pound of oil, and they have been experimentally able to get 16.7 pounds of water per pound of oil 63° B. in New Jersey, and in New England 17.8 pounds of water to steam at 90 pounds per pound of oil. This evaporation is secured by that method by which the oil vaporized to gas in a retort is carried forward to meet warmed air at the burner. A much more efficient combustion is obtainable than when the oil comes as a fluid to the furnace, and many of the difficulties connected with the fouling of the heating surface are avoided.—Engineering Magazine.

IRON AS AN EVIL GENIUS.—Iron is so generally accredited as the most useful of metals that it seems somewhat strange to find it playing the role of a troublesome constituent. But such is the case from the glassmaker's point of view. To the worker in vitrified sand, iron is undoubtedly an evil genius. The public taste objects to the green color of ordinary commercial bottles, and demands a white or colorless glass. If the glassmaker could obtain pure materials at a reasonable cost, the making of white glass would be as simple as that of green. But as the minute quantities of iron in his materials are practically ineradicable, he must seek the desired end by chemical and chromatic methods. In its various forms, metallic, protoxide and peroxide, and the several mixtures of these states, the metal runs through the whole scale of colors—black, blue, green, yellow, orange and purple. All these colors are generally counted common and undesirable. Yet iron finds its way into the glass in so many ways that it is harder to avoid than any of the besetting evils of the glassmaker's work. It is in his sand, soda and lime, in the mixer in which he mixes them and in the barrels that bring these raw materials to the factory. It is in the clay of his pots, and the tempering-mills in which the clay is worked contribute a fair contingent. In the cullet is always to be found a number of nails, and the millings or blacks from the blower's pipes contribute a most baneful, because irregular, quota. Finally, the mischievous and holiday-loving gamin of the factory adds his mite from time to time. All his art and all his oxidizers, arsenic, nitrate and manganese, cobalt and nickel, must be pressed into the service of the glassmaker in order to bring to the nearly colorless state of peroxide as great a quantity of the iron as possible, and the remainder has to be hidden by chromatic effects.—Iron.

Scientific Progress.

What Sustains the Moon.

We have read how the coffin of Mohammed was poised without support in the mosque of the faithful, from which all unbelievers were so rigidly excluded; no material support was necessary to sustain the remains of the prophet, the body itself seemed ever on the point of following the departed spirit to the realms of bliss. A perennial miracle was indeed necessary to sustain the revered sarcophagus in space. The infidel, no doubt, is somewhat skeptical about this marvelous phenomenon, and now, as ever, the truth is stranger than fiction, says *Good Words*. Far over our heads there is a vast globe, larger and heavier than millions of sarcophagi; no material support is rendered to that globe, yet there it is sustained from day to day, from year to year, from century to century.

What is it that prevents the moon falling? That is the question which now lies before us. It is assuredly the case that the earth continually attracts the moon. The effect of the attraction is not, however, shown in actually drawing the moon closer to the earth, for this, as we have seen, does not happen, but the attraction of the earth keeps the moon from going farther away from the earth than it otherwise would do. Suppose, for instance, that the attraction of the earth were suspended, the moon would no longer follow its orbit, but would start off in a straight line in continuation of the direction in which it was moving at the moment when the earth's action was interrupted.

What Newton did was to show from the circumstances of the moon's distance and movement that it was attracted by the earth with a force of the same description as that by which the same globe attracted the apple, the difference being that the intensity of the force becomes weaker the greater the distance of the attracted body from the earth. In fact the attraction of the earth on a ton of matter at the distance of the moon would be withstood by an exertion not greater than that which would suffice to sustain about three-quarters of a pound at the surface of the earth.

QUALITIES OF LITHOCARBON. — Lithocarbon, which is a mineral somewhat resembling asphalt, is the most remarkable mineral of its class known. It is claimed that it makes a perfect insulator; that as a paint it will resist heat or gases of any kind; that it is capable of being rolled into a tissue free from odor, and practically indestructible when employed in the production of mackintoshes, canvas belting, waterproof tents, etc. It possesses peculiar powers, enabling it to enter and fill the pores of iron and steel, rendering these metals impervious to acids, etc. It is also said by *Iron* to make common leather waterproof, and it can be applied to wood-pulp for the transformation of that material into what looks and acts like ebony or horn. The saturation of a ship's plates with hot lithocarbon frustrates the attack of harnacles, and the plate will neither rust nor foul. A portion of the smokestack of the steamer Dean Richmond, where the heat, through the use of a blower, rises to 800° F., was painted with lithocarbon several months ago, and remains undisturbed and unblistered, while other parts of the vessel have necessarily been painted many times. A piece of sheet-iron covered with lithocarbon japan is stated to have been subject to an actual heat of 415° F. without crack or blister, and remained so tenacious that the iron could be bent at any angle without disturbing the glossy surface. For varnishing railway and private carriages, painting iron bridges, roofs, steamships, houses, etc., this material acts as an insulator, and it is reported that it will neither crack nor blister under any known atmospheric temperature. At great heat lithocarbon will soften, but it will not take fire at any point. If all that we hear of this mineral be true it will form one of the most widely useful substances of its class known.

MALE OR FEMALE SKULLS.—It has long been most earnestly desired to discover some anatomical feature which would enable us to distinguish the skulls of the sexes. Two years ago Virchow declared that all alleged modes of differentiation so far discovered were worthless. Very lately, Dr. Thiem-Cotthus, in the "Archiv fur Klinische Chirurgie," Band 37, describes what seems a satisfactory craniological criterion of sex. The os tympanicum forms part of the posterior wall of the glenoid cavity of the inferior maxillary, and also closes in front and below the bony meatus of the ear. It arises perpendicularly from the petrous portion of the temporal bone posteriorily, and turns backward, in the woman at about half the height of the mastoid process, but in man at a less height. In the male, the bone develops a sharp edge, which divides to form the sheath of the styloid process; but in woman this sharpened edge does not exist, the bone is rounded into a tubercular form, and the fossa is shallower and flatter. Thus, in the male this fossa-tympanico-stylo-mastoidea is small, and the posterior wall of the glenoid cavity extends so deep that it is not possible for the condyloid process to slip over it. In the female, it is so much more spacious that this feature alone will serve to distinguish the crania of one sex from the other, and it also explains the surgical fact that luxation backward of the inferior maxillary is observed only in women.

ARTIFICIAL IVORY.—Natural ivory under analysis shows albumen, gelatine, alumina, magnesia, calcium carbonate and tribasic phosphate of lime. By this process quicklime is first treated with sufficient water to convert it into the hydrate, but before it has become completely "slaked" an aqueous solution of phosphoric acid is poured upon it, and while stirring the mixture the calcium carbonate, magnesia and alumina are incorporated in small quantities at a time; and lastly, the gelatine and albumen, dissolved in water, are added. The point to aim at is to obtain a compost sufficiently plastic and as intimately mixed as possible. It is then set aside to allow the phosphoric acid to complete its action upon the chalk. The following day the mixture, while still plastic, is pressed into the desired form in moulds and dried in a current of air at a temperature of about 150° C. To complete the preparation of the artificial product by this process, it is kept for three or four weeks, during which time it becomes perfectly hard. The following are the proportions for the mixture, which can be colored by the addition of suitable substances: Quicklime, 100 parts; water, 300 parts; phosphoric acid solution (1.05 specific gravity) 75 parts; calcium carbonate, 16 parts; magnesia, 1 to 2 parts; alumina precipitated, 5 parts; gelatine, 15 parts.—Scientific American.

RANGE-FINDER FOR COAST LINES.—A range-finder for coast-line defense has been invented by Lt. Isaac N. Lewis, and the first one has been made by the Brandis Manuf. Co., of Brooklyn, and is now set up at Fort Wadsworth, on Staten Island. This range-finder requires a solid foundation as close to the shore-line as possible. The semicular hed plate is 11 ft. long and 8 ft. wide, and most accurately planed. An arm pointed at the center and moved by a hand-wheel, carries a telescope, horizontal and depression verniers, pencil and various bits of mechanism not described. A chart of the harbor is accurately adjusted under the arm, and as the telescope is made to follow a fixed point on the hull of an approaching ship, the movement and position of the ship is traced by the pencil on the chart, on a scale of 1-1000 ins. to 1 ft. Tests made upon buoys 4 and 5 miles distant indicated their true distance within a few inches. The instrument is said to be useful in coast survey work, "as by following the coast-line with the telescope an absolutely accurate map can be drawn." But as the iron bed-plate alone weighs 1800 lbs., and requires a very firm foundation, its use in this direction is not plain.—Engineering News.

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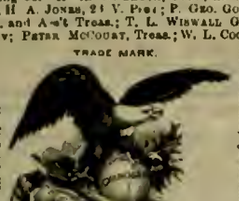

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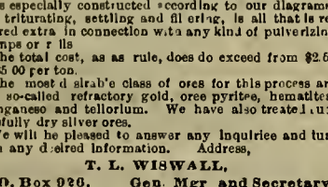

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Electricity.

Long Distance Transmission of Electricity.

The enormous demand made upon electrical manufacturers in America by the rapid development of electric-lighting, and particularly of electric street railways, says the *Electrical World*, has resulted in keeping in the background the less pressing and perhaps more difficult problems, from an engineering standpoint, of long-distance transmission of electricity. In the branches first named, the engineering questions are relatively simple, or, at least, more uniform in character, with a minimum or no risk in their application, while in the manufacturing department their accomplishment necessitates, in general, merely the duplication of standard types. As a natural consequence, all energies have been devoted to this profitable though restricted field, and the questions requiring more variety, both from the manufacturing and engineering standpoint, have been for the moment disregarded. Perhaps the dominance of the direct current, and the suspicion with which alternating current motors have been viewed have also acted as retarding causes, but with the rapidly disappearing system of "systems," which gave rise to these electrical jealousies and prejudices, we are entering an era when professional science will have a free field. We dwell upon these points, because they furnish an explanation why in the branch in question we are so far behind Europe, and why the extensive problems of transmission at Niagara and the Calumet and Hecla mines necessitated the services of European engineers. Recently, however, we are happy to note a general tendency toward a recognition of the demands from this quarter, and once taken up, we may look for the same vigorous progress that has placed us so vastly in the lead in the other electrical branches we have made our own. Any one who gives the subject even casual thought must recognize its great possibilies, and it has been a matter of surprise to many impatient waiters for the realization of these possibilities to their profit that their advances have met with so little encouragement from electrical quarters. There is a vast number of important towns and cities in the United States that are within reasonable reach of waterpowers, either undeveloped or only giving up a fraction to manufactories alongside them, and often in regions where coal is dear. Even if this power could not be transmitted profitably for ordinary manufacturing uses, it would still in most cases be able to displace the expensive, both in first cost and operation, generating plants for electric-lighting and street railways, though to a less extent with the latter, if we assume the continued use of direct-current carmotors. In the gold and silver mining regions of the West, the high price of coal and often excessive cost of delivery render that field a peculiarly adaptable one, and here the work has commenced that will soon render electrical transmission the peer of its now overtowering rivals. The superior engineering qualities that will be developed in this department will not only have their effect in others, but the greater variety in design will, besides exerting a directly beneficial effect, have a tendency, no doubt, toward modifying our present too inflexible devotion to standard types of electrical machinery. Before long, we hope to have in our columns a gradually increasing section devoted to electrical transmission that will, in time, rival those now devoted to current electrical development.

ELECTRIC CASTINGS.—There is no end to the side applications of electricity, some of which, like "electric tanniog," appear to have a certain utility, while others, like "electric sugar refining" and "electropathic belts," are nothing but rank quackery. To which category the treatment of iron and steel castings with a current during solidification belongs we shall not venture to pronounce, but certain it is that a process has been devised by which an arc is applied to a freshly poured casting to retard its solidification and to allow it an opportuoity of becoming dense and homogeneous. The method can be used to add a portion of metal to the casting by making the former an electrode, and allowing it to fuse with the latter, or for keeping one part of the casting fluid, while the rest is allowed to solidify. In this case, a separate electrode of "coke graphite or molten slag" (!) is used. Metals which "boil" when solidifying are thus provided with a free vent for extruded gases. Silicon, and, lately, aluminium have been used with success to produce sound castings, the former being particularly effective in keeping the metal quiet, and hydraulic pressure has also been resorted to. It remains to be seen whether the new plan will aid in the manufacture of steel castings, which are often apt either to be unsound, or, if sound, untrue to pattern.—Industries, London.

The Day of the Electric Launch.

As a matter of fact, the electric launch is an unknown thing in this country. One or two boats have been built and put into commission, but at the present time there is hardly half a dozen of them. In Europe, however, these launches have become widely known. On the upper Thames, for example, it is impossible to spend an hour or two on the water without seeing several of them; and the number used by Londoners is rapidly on the increase. They are certainly preferable te the fussy little steam launches with their ugly "wash," and have not proved costly to build or maintain. Perhaps one reason for the rarity of electric boats in America has been the extreme popularity of naptha launches, whose name is legion; and another reason has undoubtedly been the greater length and width of our inland waters, rendering navigation by small craft more or less risky. A third reason may have been the comparative rarity of charging stations, but in view of the great use made of the incandescent light at our pleasure resorts along the water, this trouble lessens every season. It will be a long time before the Hudson, for instance, has the density and continuity of population that the Thames and Seine have; but even now its shores from New York to Albany are fairly well dotted with places where it would be possible to obtain a supply of current.

Moreover, we believe that with the unquestionable growth in popularity of aquatic sports and pastimes in America, there is to be found encouragement for the formation of local launch companies, such as that which is to carry passengers at the World's Fair. Just two years ago, Mr. Fred Reckenzaun, an authority on this subject, published in these pages a careful and exhaustive article on this subject, and gave it as his opinion that a complete charging plant, with 12 launches, each capable of running 60 miles at six miles an hour, could be equipped, all expenses for land, etc., included, for $32,050; These boats could be run for five months in the year for $905 apiece, making a total run each of 9000 miles in that time. If these boats carried about 10 passengers each trip, the investment would be profitable, at the low rate of a cent per mile. The figures seem to us quite reasonable, as they do not take into accouot any special hiring of the launches—a very profitable class of business; and we would greatly like to see the experiment made. The subject of storage launches is brought up again by the successful trip of the "Vashti." It is late to begin storage battery launch work for this year; but it is none too early to begin mapping out a program for next year, when Mr. Astor, with his new storage launch, bids fair to set the fashion in this field. He will be very extensively imitated. — Electrical Engineer.

INCANDESCENT LAMPS FOR MINES.—Considerable attention is being drawn to the question of lighting the breasts, rooms, and headings of coal mines by means of the incandescent lamps, not only on the score of a great effulgence of light, but also on account of the extra safety which is claimed on its behalf. The matter has been frequently discussed and has given rise to the suggestion that some definite test should be made to determine the exact status of the incandescent lamp in case of breakage of a mine where dangerous gases are present. Of course it is not proposed that the risk of an explosion should be invited before the subject has been solved beyond dispute, but it should be a comparatively easy matter to attain this solution in the laboratory, where every facility is at hand for the performance of such an experiment. It would be highly interestiog, for if it can be shown beyond doubt that the incandescent lamp possesses attributes as a lighting agency far beyond any of the known existing lamps, its general advent in mines throughout the length and breadth of the land will only be a matter of a short space of time. It is already being used in many extensive plants in Pennsylvania and Colorado and has given unquivocal satisfaction. So far, however, there is no record of such a lamp being broken in a gaseous mine, but it may on other grounds be cooceded considerable merit, for gas that might penetrate another lamp could not penetrate the incandescent (unless it was broken) since the vacuum is a safe preventive. There is so much at stake in the safety of lives and the security of property that considerable profit may reasonably be anticipated to accrue from a discussion in the premises.—Chicago J. of C.

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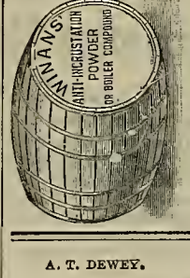

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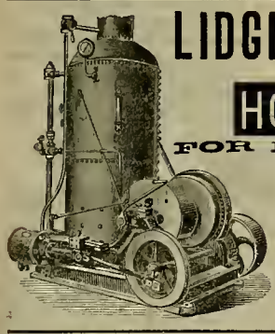

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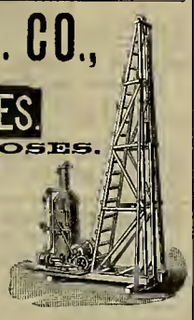

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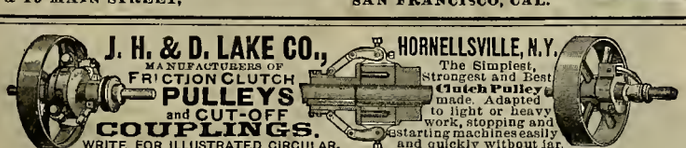

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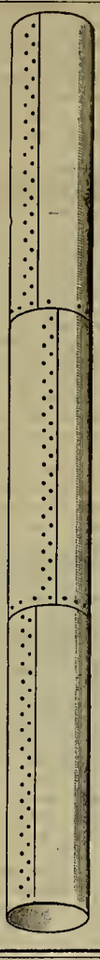

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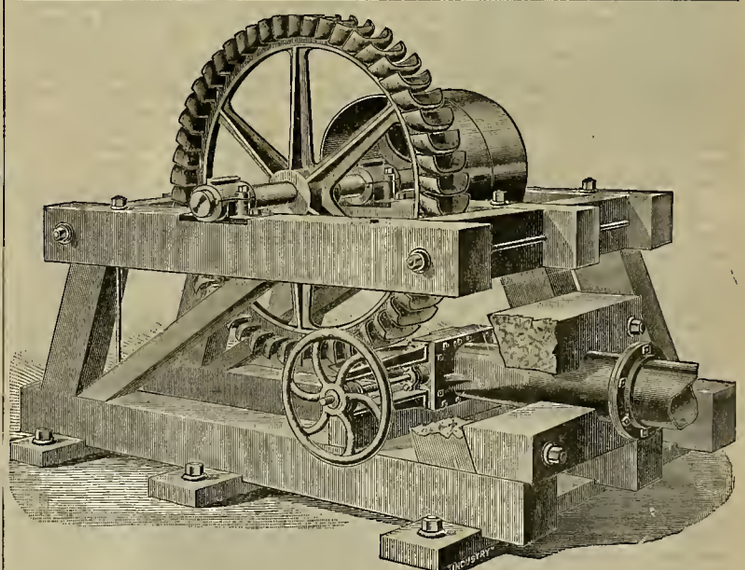

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Useful Information.

Something About Whetstones.

"An important industry of the world is the production of whetstones," said Curator Merrill, of the Smithsonian Institution, to a reporter. "Civilization may be said to depend primarily for its development upon edge-tools, and so it is ioteresting to consider the most improved methods so far devised for the sharpening of the implements used in the mechanical and other arts. The finest whetstone known for the sharpening of fine edge tools is obtained from Arkansas. In that State there are beds of what is called 'novaculite,' which is what is scientifically known as an 'altered schist.' This means a deposit of a flinty nature, usually combined with limestone, the rock thus produced being changed in such a manner molecularly, by processes not altogether understood, as to supply a surface most suitable for grinding. Arkansas furnishes the entire supply of novaculite for the United States, also filling a large part of the export demand, which is very considerable. The main deposit of the mineral is in a single hill, about 500 feet high. For the sharpening of keen edged tools, razors excepted, this novaculite is unrivaled. It is a very beautiful stone, of snowy whiteness, and is quite costly, because it has to be cut by diamond dust, owiog to its extreme hardness.

"Next in point of quality for whetstone purposes is a gray, fine-grained sandstone from Orange county, Ind. It is called, indifferently, 'Hindustan stone' or 'Orange county stone.' Very commonly it is made into long spikes for sharpening knives in the kitchen, and for this purpose it is far better than steel. Another sandstone employed for the same purpose is quarried in Cortland county, N. Y., and is called, without any reason, 'Labrador stone.' It is of a dark gray color. A still coarser whetstone, for scythes and other tools, is made from Berea grits, a sandstone found in the neighborhood of Berea, Ohio. Also there are certain qualities of fine-grained mica schists, a crystalline rock of quartz and mica, which are obtained from New Hampshire and Vermont, and utilized for hones wherewith to grind tools of the biggest sort. Nearly every quarry from which whetstones are derived is worked chiefly for obtaining building stone, the small pieces of particularly fine grade only being utilized for making whetstones.

"Three stones imported from abroad are employed in this country for whetstones. Best known of these is the German razor hone, used by barbers. It is found chiefly near Ratisbon, Germany, in the old river bed. During the era of geological formation the river brought down to that point mud, which was deposited on the bottom. The mud varied in material from one season to another, depending upon the source from which it was derived, so that during one year it was white, and during another blue. Because the white stone is costly, it is usual to back a thin slab of it with another slab of the cheap blue stone, fastening the two together with cement. Such is the ordinary razor hone of commerce. There are two other foreign whetstones commonly used in this country. One of these is a fine-grained schist from Scotland, known as the 'Water of Ayr,' and used much by carpenters and stonecutters for rubbing down the surface of other stones. The other is the 'Turkey oil-stone,' resembling novaculite.

"The stones used in this country for grindstones are mostly from Ohio and Nova Scotia, the latter supplying the best grade, which does excellently for scythes. Of foreign grindstones, most come from England. Of all whetstones, the most curious and interesting are those which are used by engravers to sharpen their engraving tools. They are of every shape imaginable, from long needle-like points to fine-edge sticks, the object being to grind the little points and edges of the steel instruments which could not be sharpened upon an ordinary stone."

AN ELECTRIC-LIGHT BATH.—An electrical journal illustrates and describes a new application of electricity, which consists in an arrangement for giving electric-light baths. We have often heard a sun bath mentioned as being beneficial, and it appears that the connection between light from the sun and that from electric lamps is supposed by some to be so close that the latter light can be used for similar beneficial purposes. The device by which electric light is applied consists of a closet whose interior is fitted with a number of 16-candle-power lamps. The closet is of sufficient size to accommodate a person when seated and leaves sufficient room so that they are not brought in contact with the lamps. The lamps are fastened to cleats standing out a few inches from the walls of the closet and the lamps lie flat so as to take up the least room and also present the largest amount of radiating surface. The walls of the closet, or that portion on which the lamps are arranged, are of polished nickel to give good reflecting surface. It is claimed that the effect of such a bath is most salutary and produces a buoyant effect. The person to be treated enters the closet and is seated on a projection on one side and a cover is put in place encircling the neck, but leaving the head free and beyond the influence of the light and heat. Current is supplied to the lamps through a resistance coil, the temperature being regulated as required. The lamps are arranged in sets so that light may be applied from any or all sides. It is stated that in ten minutes time the temperature of the closet can he raised to nearly 150 degrees, and a person receives the benefit of a combined light and vapor bath and the skin is given an appearance similar to that produced hy sunlight—that is, sunburned. It is suggested that if this treatment could be applied to the head also, it might meet with a large demand from those who cannot afford a summer trip to the country or seaside.—Invention.

The Evolution of Brass.

Brass has a respectable claim on antiquity. It was used in the temple of Solomon, was known in old Rome and in the middle ages, was associated with palace gates and monumental tablets, as it is to-day with buttons and pins. It has figured in architecture and statuary and varied its uses from representing the person of a monarch to the dignity of a doorknob. It is found in spoons and kettles, has honored the humble thimble and embellished the deadly cannon. In popular use and general service it has had a royal and ancient lineage, while its hard and unchanging complexion has furnished a metallic comparison for such human countenances as are more of brass than modesty. As an American industry, it owes its inception to an accidental shortage of supplies. When King George made his historic blunder and sent his fleet to blockade American ports, there was a consequent dearth of imported brass and official huttons. The latter was for a time substituted hy bone, but the metallic article, in spite of patriotism, drove the other out of fashion. Israel Coe, of Waterbury, Conn., made a canvass of the local housewives and solicited wornout copper kettles and saucepans. These were cut up by slow and laborious efforts, melted with other alloys in an iron furnace and capsized into rude molds. These uneven slabs of brass were passed through rolls until reduced to the desired thinness, the annealing being done in an open fire of chestnut-wood in the millyard. Success attended these crude and original efforts and led to the establishment of a rolling-mill at Waterbury, where the surprising output was made of 80,000 pounds of brass in one year. To-day they make annual totals of millions. The manufacture of brass kettles was a logical sequence, and the brass industry started in the Naugatuck valley perpetuates as it preceded American enterprise in this direction. It has deployed on every available line of service and kept in touch with the volume of demand and the fastidiousness of taste. It represents an industry with many ramifications, and has kept a level step with progress in improvement and manipulations. Its inception and development is, however, an added example of the persistent and energetic qualities so largely characteristic of American metallurgical progress —Age of Steel.

TELEPHONE SERVICE.—A paper read by Mr. Hugh Neilson before the Canadian Electrical Association makes some interesting comparisons between the long distance telephonic and the ordinary telegraphic service. He says that the long distance telephone rates in the United States are based on a schedule of one cent per mile, with a minimum charge of 50 cents. It appears that some complaint is made by the customers that for distances over 200 miles these rates are too high, but Mr. Neilson points out that owing to the unavoidable differences of conditions, telephone rates, unlike telegraph rates, must be considered from the same standpoint as railway tariffs, that of distance traversed. To carry on a telephonic communication requires the exclusive use for the time of two wires, while by applying the quadruplex system of telegraphy, four simultaneous communications might be sent at once on each of these wires, so that, all things considered, the earning power of a telegraph wire may be anywhere from two to eight or more times that of a telephone wire, computed on the basis of the number of words transmitted. Mr. Neilson therefore considers that the only necessary limit to the distance of telephonic transmission will prove to be a commercial one. He claims that Canada leads all other countries in the general use of the telephone, and asserts that more telephones are there in use, in proportion to population, and at a lower average rental, than in any other country in the world.

THE ARROW POISON IN THE NEW HEBRIDES.—M. Dantec has examined and experimented with the arrow-poison used by the natives of the New Hebrides. He finds that it contains neither vegetable poison nor serpent virus, but consists of earth impregnated with vegetable matter taken from marshy places and containing Pasteur's *vibrion septique*, or bacillus of malignant œdema also the bacillus of tetanus. If the arrows have been kept a long time, or have been much exposed to the sun, the *vibrion septique* may have been destroyed; the danger then is from tetanus. When the arrows have been freshly prepared and the *vibrion septique* is still active, a wound from them causes death in a guinea pig from septicæmia in from 12 to 15 hours; tetanus, which takes longer than that period of time to develop, does not, under these circumstances, show itself. It is interesting to remark that the horse is unknown in these islands, consequently the theory of the equine origin of tetanus would seem to be negatived by these researches.—Lancet.

ASPHALT PAVEMENTS AND GAS —An interesting observation respecting the deterioration of asphalt pavements by escaping illuminating gas is reported from Germany, where, at Frankfort-on-the-Main, asphalt roads that were put down in 1885–86, were shown to he much changed some two years later—1888. Cracks were observed, about one inch wide, quite similar to those in a dry field. In the interior the asphalt had become transformed into a tarry mass, which gave off the odor of illuminating gas That the escaping gas was largely responsihle for the changes in the roadhed would seem to be so from the fact that the alterations were almost altogether ahove the line of the gas mains. On taking up the pavement fissures were found in the concrete underneath, which permitted the gas to reach the asphalt. The carhohydrates were absorbed, principally the henzine. The asphalt became pasty and lost its cohesion.

FOR practical purposes the Mediterranean may be accepted as being what it is popularly supposed to be, a tideless sea, but it is not so in reality. In many places there is a distinct rise and tall, though tide is more frequently due to wiods and currents than to lunar attraction.

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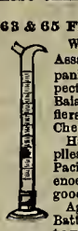
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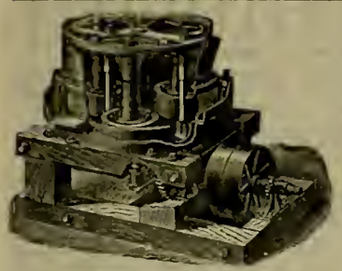

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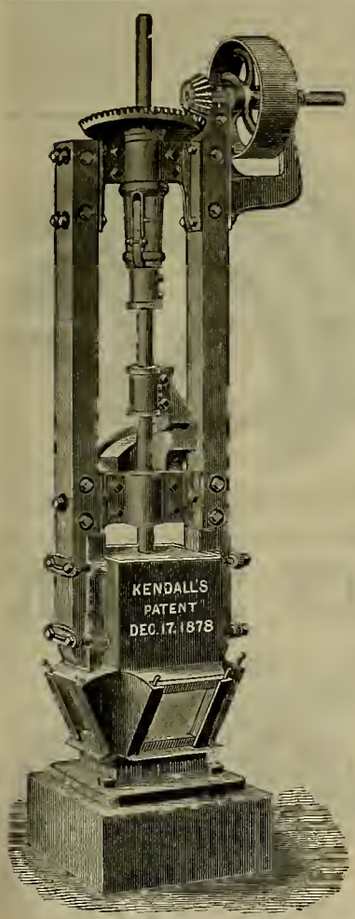

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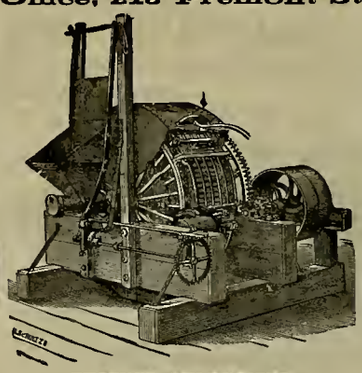

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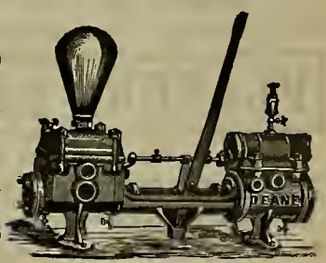

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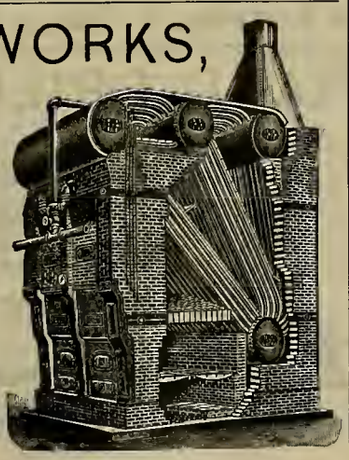

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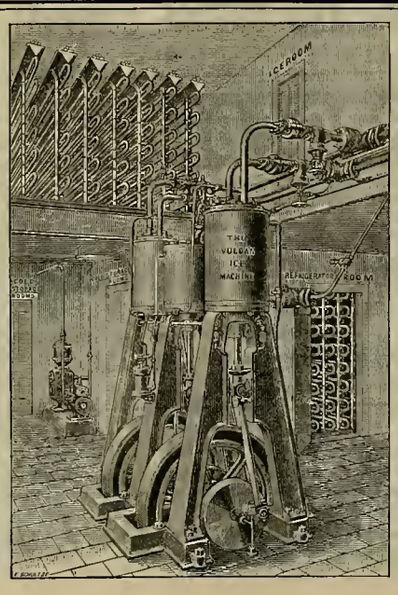

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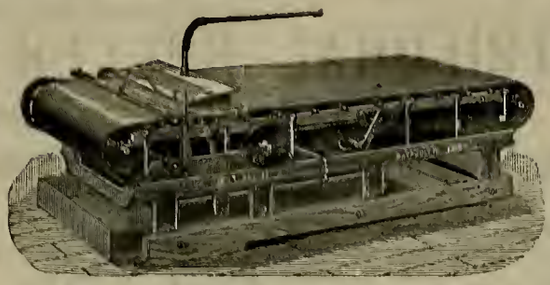

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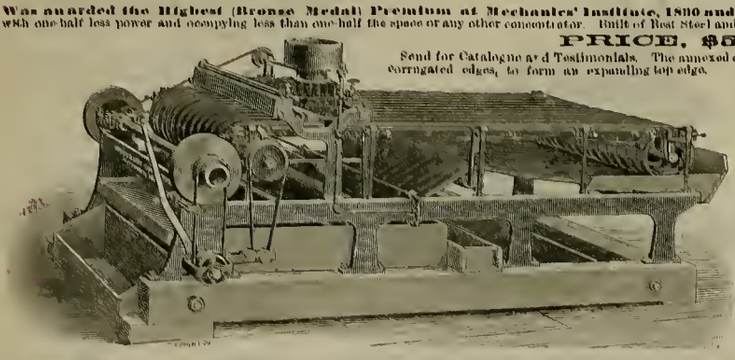

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[Copy] Yours faithfully, S. HARRIS, Manager.

THE SAN JACINTO ESTATE, LIMITED—Office of General Representative, P. O. address, South Riverside, San Bernardino County.

CAHUILO, February 17th, 1892.

GEO. E. WOODBURY:—Your letter of inquiry about your concentrator came to hand in due course. Your machine is doing well, the motion is all right, and the machine is giving entire satisfaction. Yours faithfully S. HARRIS.

PATENTED Aug. 19, 1890.

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We are now having our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over *any others* will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth. We can safely say that it is a better concentrator belt than has ever been manufactured. It will last much longer and will handle more pulp. We also manufacture smooth belts with same flanges when desired.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

SUTTER CREEK.—Amador *Ledger*, Oct. 1: Mining in this section continues to look more and more encouraging every day. The sound of the 40 stamps at the Hector is expected to be heard; the dumps in the mill and the big bin midway between mine and mill are full of ore. The compressor, which has principally been the cause of delay, is finished, and in a day or two sufficient men will be in the mine to keep the mill running steadily. The Belmont is running about as usual, with a very slim force. They are very much hampered on account of the incapacity of the hoisting machinery. The Wildman is running along in the usual prosperous way. The South Eureka continues to improve as developments go on. They have a ledge now on the east eight feet wide, which is sprinkled throughout with the precious metal in paying quantities, and they all feel confident that it is only a few months till the South Eureka will be classed with the best paying mines of the county.

STRIKE.—Wm. Sturnaman and his partner, Scott, have made a very rich strike in the Pioneer district. They found a ledge from 15 to 18 feet by 18 to 22 inches of free milling gold and sulphurets. Experts place the value of the rock in sight at from ten to fifteen thousand dollars.

QUARTZ MOUNTAIN. — The Gold Mountain quartz mine is still booming under the administration of Mr. Farwell and Wm. Ford. They have commenced operations on the McCulbert mine, with a small force of men. The Goodman is still at a standstill.

COYOTE HILL MINE.—*Dispatch*, Oct. 1: The Coyote Hill mine, above Ione, is turning out very rich. The main tunnel is in 800 feet. An 80-foot west drift found gravel that yields five cents to the panful. The channel at this point is from two to three feet wide. Fourteen men are now employed at the mine. They board at John Evans, near by, but Supt. D. G. Hughes of Sutter Creek says that the company will erect a boarding-house in the near future. A ditch six miles long, and just completed, furnishes water from the head of Cedar creek.

El Dorado.

TAYLOR.—Georgetown *Gazette*, Sept. 29: Few of our people comprehend the real magnitude or the importance of the Taylor mine, and the beneficial influence which its steady and advancing growth in bullion output is having upon the possibilities of our quartz-mining industry. One of these days there will be such an awakening in the development and milliug of gold-bearing lodes ou this divide as was never seen before. There is no boom in this slow but steady growth now going on. It is a cold-blooded, legitimate business advance, and for that reason few people catch on, as they belong to the old school of miners and businessmen who seem never to wake up and get a move on only when some one blunders on to a pile in the grass roots, or some new placer find. Our great lodes of milling ore have scarcely yet been prospected, and few of our resident population realize their extent and value.

THE INLAWILD GOLD MINING CO., whose mine is between here and Garden valley, is receiving a heavy consignment of machinery for the additional 20-stamp mill now going up. New buildings are being erected and the camp presents a scene of much life and enterprise.

Mono.

BONIE CON.—*Miner*, Sept. 30: During the last week, east crosscut No. 1, 550-foot level, has extended eight feet. North drift from Fortuna stope, above the 300-foot level, was extended six feet. Upraise from north drift, 200-foot level, was extended 11 feet. There were employed six miners, one carman, and jointly with Mono one engineer, one blacksmith, one watchman, one fireman, one foreman.

MONO. — During the past week we have cleaned out and timbered the main south drift, 50-foot level, a distance of 60 feet.

BULWER CON.—A north drift has been started from the flat upraise and driven in vein matter along the footwall a distance of 12 feet. An upraise has also been started from the old stopes south of No. 5 upraise, near the footwall, and it is now up 13 feet; the face is in vein matter of a favorable nature. Are rebuilding the main ore-chute from the Bulwer tunnel level up.

Nevada.

WYOMING MINE.—Grass Valley *Telegraph*, Sept. 29: The Wyoming mine, situated in South Grass Valley, is continuing to send out good ore. Samples brought to town to-day show well in free gold and carry sulphurets that are rich in the precious metal The Wyoming is indeed a most promising prospect and has a location that almost insures success as a big payer. Work is being prosecuted with the diligence and with proper economy.

CREEK-MINING.—Grass Valley *Union*, Oct. 5: Since the stoppage of hydraulic-mining the debris in Deer creek has washed out to such an extent as to permit of the resumption of sluice-mining in the bed of the creek, and there are now a number of white and Chinese miners at work in the vicinity of Nevada City, Newtown and other localities.

THE DELHI MINE.—Grass Valley *Union*, Oct. The present appearance of the Delhi quartz mine, on the Middle Yuba river, is very encouraging as to its future prospects. The lower tunnel, which is about 90 feet above the level of the river, has been driven to the vein and a shaft sunk upon it to the depth of 50 feet. The vein in the shaft is from 18 inches to 2 feet in width, and the quartz extracted from this shaft has paid all the expenses of sinking. One hundred tons of this quartz has been crushed at the mill, and has yielded an average of $20 per ton. The development is so good that pumping machinery is now to be put in which will be of sufficient capacity to handle any flow of water that may come in, as it is expected that when the shaft is sunk below the level of the river-bed that considerable water will have to be contended with.

Plumas.

EXPLORATIONS RESUMED.—Quincy *National-Bulletin*, Sept 28: Prof. J. E. Mills, manager of the interests of Agassiz & Shaw, in this State, is now preparing to resume explorations in American valley by sinking two shafts about two miles above Quincy. This is a very important move, and we are glad to chronicle it. It will result in scattering considerable money in this community—a very much needed article at this time. The enterprise should have the best wishes of every person in the county.

THE CRESCENT.—Several days ago a large body of ore was encountered in the Crescent mine, on the 400-foot level, in the drift running in a southerly direction from the shaft. The body of ore is what is known as the Horseshoe vein, and it is about ten feet wide. It is low-grade as yet, but may develop into something much better. Twenty-four stamps of the mill are now running steadily. The development just made is of very great importance, as it proves that the veins in that section go down. We believe this is the deepest quartz mine in the county.

GREEN MOUNTAIN.—Not a large force of men is employed in this mine at the present time, but the work is important. A rich body of ore in the face of the lower tunnel is reported, likewise good developments in other parts of the mine. The recent developments in the Crescent near by, which are probably 700 feet below No. 6 tunnel of the Green Mountain, furnish a strong argument as to the quantity of ore in the latter mine below the present workings. However, years will be required to exhaust the large ore-bodies beyond and above the face of the present lowest tunnel. There is no question that this mine is in one of the greatest mineral belts in this part of the State, the Crescent mine being the eastern development and the McGill & Standart the western. Intervening are the Green Mountain, the Altoona, the Indian Valley and others. From the Altoona, Judge Emmons is now crushing ore which, we hear, is paying him a good profit, although it is hauled about two miles to be milled.

MCGILL & STANDART.—Through the columns of this journal, our readers have become somewhat familiar with this property as the Drury mine, purchased by the present owners nearly two years ago, and successfully operated by them since. Twenty stamps of the Kettle mill are running steadily on ore from this mine. The mill, to which the quartz is hauled, is situated about half a mile from the mine. The owners have opened up the property, and while doing so, have extracted, during the past year and a half, close to $30,000. In the canyon east of the McGill & Standart propsrty, Firmstone, Richards & Cozzsglio are running a small mill on ore from the Phœnix. Although operated in a small way only, good reports come from the property. At Wolf creek, about ten days ago, McIntyre & Warren started a new mill on ore from a mine which they have been prospecting for some time. Not a sufficient test has yet been made to determine the value of the property.

Shasta.

SOUTH FORK NOTES.—Cor. Anderson *News*, Oct. 1: It now looks as though we were going to have reduction-works here at last. E. L. Ballou commenced work last week getting ready to put up a mining plant. He is going to put in a Tustin crusher and Frue concentrator, and then reduce the concentrations by the chlorine process. He will work both gold and silver ores. Mr. Ballou will only work on custom ore when slack of ore from his own mine. He thinks that by this process he can make $7 ore pay. Joe Moody is running his arrastre on ore that assays from $30 to $50 per ton, but all he can save with the arrastre is from $3 to $9 per ton. Quite a loss. The Shirland Bros. are working for Ballou, getting out timber for the new plant. They have several good mines that they will work as soon as they have any way of reducing the ore. Hubbard and Kingsbury have stopped work on their mine for a short time. They have some good ore on their dump, some of it assaying as high as $160 per ton. W. D. Bull has the boss mine so far. He has at the depth of 30 feet a fine showing, the ore streak being from 4 to 8 inches thick and worth over $250 per ton. Men who claim to be good judges say he has several thousand dollars in sight. Judge Read is talking of putting in a concentrating plant in a short time. He has located the old Willard water right, and will put in his plant somewhere near the Hubbard place on South Fork. J. P. Wright has several men at work on his mine and is taking out some good ore. Lewis & Co. have shut their mine down for a short time. Wm. Irelan, of San Francisco, father of the State Mineralogist, was here last week looking after mining interests. While here he located a millsite where the old Chicago mill stands. He is going to have it patented, and thinks there will be a party from the city in a short time to take charge of the old Chicago mine.

Sierra.

LONA STAR MINE.—Grass Valley *Telegraph*, Oct. 3: George Mainhart, superintendent of the Omaha mine, and Theo. H. Wilhelm have returned from the Lone Star mine, near Gold lake, in Sierra county. They found everything looking in tiptop shape up there. There is a ledge between two and three feet in thickness in the face of the tunnel, and they have fully 200 feet of backs. Some of the ore brought down can be seen at Theo. Wilhelm's butcher-shop. It is full of mineral and shows good coarse gold very freely. Mr. Mainhart thinks well of the prospect In a short while the company will hold a meeting and will then determine what steps they will take for working the mine this winter.

Siskiyou.

HUMBUG MINES.—*Telegraph*, Oct. 1: Mr. Hunt is down about 65 feet on a five-foot ledge, at the bottom of which he has formed a station for the purpose of running side drifts, but will also keep sinking. He is working both night and day with a force of 18 men. He is moving the old mill up to the new mine and it will be in working order in about a month. The Spencer mine is down about 280 feet, where the ledge has narrowed but is of very high grade ore, and they are taking out sufficient to keep the mill running constantly. The Boyle mine is working a full force of men, with indications of a very rich mine. He is in about 30 feet on his lower tunnel. The Humphrey mine is working a full force of men and are now transporting ore over their new road to the Hegler mill. They struck an exceedingly rich bunch of ore in their mine last week. The Jones boys have a large amount of ore on the dump which they intend crushing soon. Mr. Jackson has a crosscut of about 80 feet with a tunnel 60 feet in length on the ledge, showing up a fine body of ore. There have been several other good prospects found lately. This is a prosperous camp, with a very bright future in store for those who have property in this district. Lash & Morrison have cleaned up for the season, having made a very good season's run. They are now stopping at the Franco-American hotel and are both on the marry. This would be a fine catch for some of our young ladies, as they are both hard working young men, and money, "don't mention it." Cartwright & Phillips have about completed their air tunnel. They will now commence to open up stopes on the main ledge to get a large quantity of ore out on the dump before putting up their mill. They have a fine chute of pay ore in their air tunnel, which prospects fully as well as the pay chute on the main ledge.

Trinity.

FROM CINNABAR.—Trinity *Journal*, Oct. 1: We take the following from a private letter written at the Cinnabar mines in this county: Material for an occasional item from this camp will be very limited for some time, as I don't think the Integral Company will employ more than 8 or 10 men during the winter months. At present they have from 18 to 20 men steady on their work. They are building a furnace at the present time of over 30 tons capacity, and have been running their sawmill, with 10,000 feet capacity per day, for the past month. The lumber has been used chiefly in putting up new buildings, among which are a large boarding-house, a sleepinghouse for the men, also a sawmill and barn, and a furnace in course of construction, all of which are situated at what is known as the Boston mine. The company have also built a barn and are putting up a building euitable for a store and their office on what is knowu as the Altoona camp. The prospects for a large camp next year are very favorable.

Tuolumne.

A MINING STRIKE.—Modesto *Herald:* About a year ago the *Herald* made mention of a promising quartz claim in Tuolumne county owned and in process of development by M. A. Turner of Salida and W. E. Garrett of Ripon. The claim is situated on the Yosemite valley road, 25 miles this side of the valley and not far from Crocker's station. The owners have lately performed the annual assessment work on the property and have a tunnel in sufficient distance to cut the vein at a depth of 75 or 80 feet. A shaft about 15 feet in depth is also on the ledge. Recently a quantity of the ore from the vein, which is nine inches wide, was sent to Henry G. Hanks, of San Francisco, for assay. On Monday we were shown that eminent gentleman's assay certificate, by which it is seen that the ore yielded at the rate of $62.01 per ton in free gold and $1.67 per ton in silver. As Mr. Hanks remarks in a letter accompanying the certificate, this is unusually high-grade ore and will undoubtedly yield very profitable by mill process. Next spring and summer the owners propose to carry on development operations on quite an extensive scale.

NEVADA.

Washoe District.

CONS. CAL. & VIRGINIA.—*Chronicle*, Oct. 1: 1750 level—Have continued to extract some milling ore in working upward from the sill floor to east crosscuts Nos. 1, 3 and 5 from the main south drift, and from the point where the upraise from the end of the drift run south from the end of the crosscut run west from the end of the main southwest drift connects with the 9th floor openings. The upraise started in the crosscut run east from the end of the south drift last mentioned has been carried up 8 feet; total length 45 feet; in ore of milling value. Have continued making repairs to the southwest drift. 1800 level—Along the south end of the drift running south from the crosscut run east from the winze No. 1 sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. In stoping upward from the drift run south from the crosscut run east from the bottom of winze No. 2, down 45 feet, have extracted some milling ore. There has been extracted from all parts of the mine during the week 1001 200-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $28.25 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $23.64 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $17,492.02.

OPHIR.—1465 level: From the south drift, 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, the west crosscut No. 2 has been advanced 14 feet; total length, 115 feet; in porphyry and clay carrying a little quartz of nominal value.

MEXICAN.—On the 1465 level, the west crosscut, which was started from the drift run north from the crosscut run west from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, has been advanced 23 feet; total length, 116 feet, continuing in a soft porphyry and clay formation.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift has been extended during the week 18 feet; total length west from the joint shaft, 2455 feet. The face is in hard black porphyry.

UTAH.—The north drift from west crosscut No. 2 has been extended 22 feet; total length 60 feet. This drift continues in porphyry formation showing some quartz with clay separations.

SIERRA NEVADA.—West crosscut No. 2, from Kenosha tunnel, started from south drift, 800 feet in, has been advanced 32 feet; total length, 180 feet; face in porphyry. The Cedar Hill drift has been advanced 14 feet, from which some pay ore has been saved; face in fair-grade quartz. No work has been done in the intermediate tunnel the past week, as we are engaged in putting in compressed air pipe and making wagon roads to the tunnel.

ANNEX.—East crosscut north on 420 level was advanced during the week 22 feet; total length, 164 feet; formation clay and porphyry.

GOULD & CURRY.—On the Sutro tunnel level, work has been temporarily discontinued in the face of the joint north drift, and the men are cutting a drain and doing some needed repairs.

BAST & BELCHER. — During the week east crosscut No. 2, 145 feet north of east crosscut No. 1 has been advanced 10 feet through hard porphyry; total length, 24 feet; also did considerable repairing on this level.

HALE & NORCROSS.—We continue retimbering main shaft above the 1000 level. Main Incline—Are making the necessary repairs. 1100 level—Have made some repairs to the north drift. 1300—Are retimbering the main north drift on this level. 1800 level: During the week advanced No. 1 west crosscut 25 feet; total length, 25 feet; face in clay, porphyry and streaks of quartz. West crosscut No. 2 on this level was advanced 18 feet; total length, 18 feet; face is in quartz of low assay value.

CHOLLAR.—We are making necessary repairs on the upper levels. The east crosscut, 160 feet south of north line, 930 level, is in 102 feet; face in soft porphyry.

POTOSI.—Extracted and sent to mill the past week, 442 tons of ore from the 550, 930, 1100, 1150 and 1300 levels. Average battery assay, $23.32; average car sample assays, $31.36. Shipped to the Carson Mint 370½ pounds of crude bullion.

BULLION.—The north drift from top of raise, 320 feet south of north line, 1300 level, is ont 37 feet; face is in porphyry and streaks of quartz. The joint southeast drift from bottom of Potosi winze, 1850 level, is out 92 feet from footwall; face is in porphyry and quartz. The northwest drift from 1800 station, Ward shaft, is out 900 feet; face in porphyry.

WARD SHAFT.— The joint Alpha and Exchequer west crosscut, 1800 level, is out 100 feet; face is in porphyry. The joint Potosi and Bullion northwest drift, 1800 level, is out 900 feet; face is in porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extracted and milled 172 tons of ore of the assay value of $17.45 per ton as per battery samples.

ALPHA.—The joint west crosscut on our north line of Exchequer, 1800 level of the Ward shaft, is out 160 feet; the face in porphyry.

EXCHAQUER.— The joint west crosscut on the line of Alpha, 1800 level of Ward shaft, is out 100 feet; face is in porphyry.

NEW YORK. — The south drift from the winze, 50 feet below the 650 level, is out 30 feet; the whole distance is in fair-grade ore. The west crosscut, 800 level, 110 feet north of shaft, is out 22 feet; face in clay.

SILVER HILL.—We are stoping out on a streak of ore on the 400 level about 2½ feet wide that will assay from $25 to $30 per ton. Extracted and sent to mill the past week 199 1905-2000 tons of ore from the 260 and 490 levels. Milled during the week 199 1905 2000 tons of ore. Average battery assays, $20.47; average car-sample assays, $25.42.

Ely District.

CHAINMAN.—Cor. Salt Lake *Journal*, Sept. 30: The Chainman, at Ely, is improving every day and the big eale ie assured in the near future. McGill is making a success of the cyanide process of ore-reduction and saves up to 95 per cent on the Chainman ore. The Florida ie being worked in a capable manner by McDonal and Cupid, and will bring them money in the next year. Gen. Thomas and partners are working the Robust, Mohawk and others; all ehowing good gold ore. Williamson & Co. are working the Aurora, and light soon will come and they will reap a golden harvest in the near future. All this camp needs to make it second to none in the West is a little capital judiciously expended, and we will live despite the gold bnge.

Osceola District.

DAY-WAEHINO.—Cor. Salt Lake *Journal*, Sept. 30: At Osceola the drywashers are paying well and the O. G. Co. are having a very prosperous run, and have 35 men at work all the time. Millick & Co. have etrock it rich in the Comberland, eo I hear.

Ferguson District.

AT WOAK.—Ferguson *Lode*, Sept. 30: There is a force of men at work on the Jake mine, timbering and straightening the ehaft, and ae soon as thie is completed sinking will he commenced. The owners think they are on the Magnolia ledge and are confident the claim only needs development to make it a paying proposition. A new strike has been made in

the Gold Wedge mine on Gold Hill. Ore hes heen encountered which looks identically the same as the pay rock of the Magnolia, end the owners are, es a consequence, in juhilant spiri's. On Tuesday, the 20th inst., Mr. John Sevenoaks honded a one-fourth interest in the claim known as the South Extension of the Magnolia. This claim is owned by R. G. Crendall and C. E. Holt, and Mr. Sevenoaks takes Mr. Crandell's interest in the property. The price to be paid is $5000. It is wanted for the purpose of working the Magnolia.

ARIZONA.

SALVATION ARMY MINEES.—Tomhstone *Prospector*, Sept. 29: The claim on the south slope of the Auachuca mountains, heing worked by memhers of the Salvation Army, is proving to be e paying property. Two rock-crushers and a Frue-vanner concentrator are in place end ready to start up. The engine which runs the mechinery is a new one, and the trial run was successful. The concentretes are worth $300 per ton in copper and silver. Sufficient ore is in sight to run the works for three years. It is the intention to plant a colony at the mine, which is in a very picturesque part of the mountains. A number of salvationists from Los Angeles will join, and rules similar to the Topolobampo idea will be adopied on a broeder plene. The perty is a contented and happy one. Services are held morning end evening.

IDAHO.

SOUTH MOUNTAIN.—Ideho *Avalanche*, Sept. 27: All of Adams & Hnnt's and Berry & Hunt's mines heve heen closed out to a Colorado party represented by T. N. Shank. The deal includes the now famous Union mine, the first mine in South Mountein in which gold in paying quantities has been discovered. The new owners intend to develop the properties on a large scale, and have sent over a crew of miners for that purpose. Shipments of high-grade ore will commence at once, and within a month South Mountain will be heard from es a producer of the yellow metal.

BLACK JACK.—They are still drifting south on the vein, the ore continuing in about the same quantity and quality as when last reported. The winze is now down 55 feet in good ore, but water is hothering them considerably. Ore is still being sacked for shipment, though no stoping is being done at present.

BLAINE.—The Blaine tunnel is now in 1671 feet, and it is expected that the Trade Dollar ledge will he cut at almost any time.

TRADE DOLLAR.—Winze D from tunnel No. 3 has reached a depth of 105 feet. Sinking has been discontinued for the present, end a drift is being run north, now in 40 feet. The vein is five feet wide, one foot of which averages $200 per ton. In the 55 foot level, now in 60 feet, they have 16 inches of $500 ore in face of drift and in the stope. Returns were received Thursday night from the last car of ore shipped as follows. $884 per ton, or a fraction less than $10,000 for the car. There is nearly enough ore at the railroad, en ronte, and ou the dump for another car which will be shipped shortly.

SILVEA VAULT.—This pioperty was recently bonded by W. H Dewey, John Galey end E. H. Dewey. They have sunk a shaft 45 feet, but have not found the footwall. Thirteen feet of this ledge assayed from $33 to $240 per ton.

THE NEW CAMP OF DIXIE.—Cor. Elmore *Bulletin*, Oct. 2: Nearly everything in the way of development work is at a standstill, but prospecting is being carried on vigorously. It will he remembered that Peter Johnsen got a bond on three of the leading mines from the Wilson boys some time ago. Since then Mr. Johnsen has heen busy trying to sell the property to Eestern capitalists, and it is thought hy those interested that the sale will be made inside of two weeks, and, if so, the purchasers will put up suitahle machinery yet this fall for the reduction of base ores, and then Dixie will be second to no other district in Idaho, for we have good mines and lots of them. The Gold King mine, owned hy Groff & Kerchner, is now heing worked hy sinking a winze and shows a fine vein of very rich quartz. There have heen about 50 locetions made here this snmmer.

NEW MEXICO.

CROWN POINT.—Silver City *Enterprise*, Sept. 20: Tulloch and Givens mede a shipment of ore last week from their Crown Point mine in Cow Springs mining district. The ore ran 198 ounces silver per ton. This was an experimental shipment. There are large hodies of ore in the mine ready for extraction, end several tons on the dump, which will run much higher then the first shipment. The Piedmont district is steadily coming to the front. McDermot shipped 14 tons of ore to tbe Deming sampling works last week, which averaged $175 per ton. The lessees of the Alabama also made a shipment of the same amount to the same place which returned about the same.

ALHAMBA.—At this camp, in the Alhambra mine, in both levels the wonderfully rich ore for which this mine is famous has been encountered and severel tons are now piled in the orebouse to be broken np and sacked, or already sacked for shipment. Much of this ore is of too high a grade to risk transportation by freight and will have to be shipped by express or melted into bars of bullion at the mine. A large proportion of the ore from the mine will run above $8000 per ton. In the Hobson mine, in both the lower levels, rich ore of the same grade as that produced in the Alhembra, has heen found. The ore is native silver and argentite, the only approach to base metals found in the mines of the camp being nickle, which is found as an alloy with the native silver, and also as a sulphide assaying high in silver. There is prohably no mine in the country that can show as much development work done on as permenent and economical a basis as these two mines. They are both thoroughly equipped as to hoisting facilities, orehouses, and everything necessary to an economical system of mining, without further extraneous expense for years to come. In the MINING AND SCIENTIFIC PRESS of the 17th ult. there appears an article in regard to the rich ores of the Golden Fleece mine at Lake City, Colorado, stating that the ores were so rich as to necessitate the shipment of the ore hy express. Now, here is a camp that has made shipment efter shipment hy express, and not from one mine alone, but from four different properties. The Alhambra, the Hohson, the Solid Silver and the Rose mines all ship their high-grade ores hy express. Nor is this ore found in such exceedingly small bunches or pockets, but in regular chutes, as ore of lower grade is found other mining localities. There is in the *Enterprise* collection one piece of native silver-ore four inches in thickness and nearly a foot in length broken from a mass weighing several hundred pounds. This sample has heen prononnced hy professors connected with the Smithsonian and other great institu es the finest single specimen produced in the United States, and yet it would hear no comparison with other pieces produced from large ore-hodies in these mines. As, for instance, the writer has seen blocks of native silver which came from Solid Silver Company's mine which were 10 inches in thickness and 18 inches to 2 feet in length that were 80 per cent native silver, and on last Tuesday saw a block which was more than a foot in thickness and about 18 inches in length, showing by the fracture on either side that it came from a mass of equal thickness on every side.

MONTANA.

ON BOULDER CREEK.—Phillipsburg *Mail*, Oct. 1: R. T. Rombaner and Simon Johnson have made quite a nice strike on Boulder creek. Their claim is called the Meda and is located about three and a half miles above Medhurst, on the Mt. Powell road. They ran in on the vein about 30 feet above the lead from the incline shaft where they struck the first galena ore, about 50 feet in from the mouth of the tunnel. They have a lead about six feet wide where they are working, between two nice walls. The vein-matter is principally pyrites of iron and white qnartz and assays taken some time ago gave 90 ounces in silver and 40 per cent lead, with some gold.

THE ELIZABETH.—A new wagon-road is being graded from the Granite road down toward the Elizabeth boist, and a good many people are of the opinion that a resumption of operations will soon be hegun on that property.

ON BALD MOUNTAIN.—William Frazer, one of the owners of the Carpp & Frazer mine, on Bald mountain, was in town during the week and made known the important fact that they had reached the ledge in the west crosscut. The ledge where found is said to he quite extensive, but no definite knowledge of the ore-deposits could be ascertained. All the expert reports on this property have been to the effect that the permanence of the mine depended on the western developments. The Malony property, which joins Carpp & Frazer on the west, has lately heen bonded to an Eastern syndicate.

THE SALT HILL.—Work is being prosecuted steadily on Charles Clark's property, the Salt hill, under the supervision of Harry Clarke. It is not the intention to sink, as has heen erroneously reported. The purpose is to erect a shafthouse on the property. They intend to upraise instead of sink, and the present anticipations of those operating the property are to have the shafthouse built and the machinery in running order this fall.

OREGON.

MINING NOTES.—Bedrock *Democrat*, Oct. 1: The 65-ton mill plant at the Baisley-Elkhorn will be in operation about Oct. 1st. The mill plant of the Robinson Mining Company at Elkhorn mountain is about completed, and will be started crushing hy the first of the month. Its capacity will be 25 tons every 24 hours. The Hurdy Gurdy Mining Company is erecting a Tremaine prospecting mill on their property near Rock creek. The new ten-stamp mill on the White Swen mine is in course of building, and when in operation, large bullion outputs will be had. Geo. Borman came in yesterday from a prospecting tour in the Robinsonville country, and reports fair success. The Schnarr property at Greenhorn is said by those recenily visiting the mine, to be the greatest mine in the country. The placer season throughont Baker and Grant counties is about over, and the yield hes been greater than for meny years. The season's run at the Nelson mine is about closed. Good times are reoorted from Cracker Creek. The Eureka and Excelsior mines are running with a large force, and the mill of the P. R. M. Co. is pushed to its full capacity. The North Pole Company has a large force of miners employed, and the millbuilding operations are being pushed rapidly ahead. Upward of 300,000 pounds of machinery purchased in the East will soon arrive here. The Baker City Foundry and Machine Works is engaged in turning out 13,000 pounds of shoes and dies for the White Swan mill, hesides a large amount of other work for various mill plants throughout the country. It has been about conclusively demonstrated, we are informed, that the White Swen ledge is a continuation of the Virtue mine and is a true fissure. The sales of the great Le Bellevue at Granite and the Robbins-Elkhorn at Elkhorn mountain, should negotiations be closed, will give Baker county the moet extensive advertising in the mining world that hes ever before been her good fortune, and. from the very moment that capital takes hold, there will be an advance movement of the mining industry of Baker county that will bring about increased prosperity to our people.

SOUTH DAKOTA.

TIN-MILL.—Deadwood *Pioneer*, Oct. 1: It is now given out upon unsettled authority that the Harney Peak Tin Co. will endeavor to place its new mill at Hill City in operation by November 1st. Over 300 laborers are employed upon the railroad spurs to the mines, and their construction is being hurried with all possible speed. Operetors of the Minerva mine in Blacktail gulch are still engaged in pumping water from the lower levels. A large quentity of ore, broken and ready to mill, is covered by the water, and operations of the mill will commence as soon as the mine shall have heen placed in a thoronghly dry condition. The Welcome chlorination plent et Rapid City has heen closed down for abont ten days in order to give an opportunity to reline the present roasters with firebrick, end to put in position the machinery for the two new roesters which is expected deily. When the plant starts up again, it will have a largely increased capacity, and will give employment to an increased force of men.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 27, 1892.

483,318.—LATCH AND LOCK—J. E. Armstrong, Santa Cruz, Cal.

483,416.—DEVICE FOR CLOSING ELEVATOR SHAFTS—N. J. Blagen, Portland, Or.

483,319.—MACHINE FOR GAOOVING SHOE SOLRS—Geo. Bryant, S. F.

483,136.—MUSICAL INSTRUMENT—W.J. Christy, San Jose, Cal.

483,380.—CIGARETTE MACHINE—H. S. Grace. S. F.

483,442.—GRIP PULLEY—A. S. Hallidie. S. F.

483,484.—FUMIGATOR—F. A. Hoffman, Byron, Cal.

483,449.—HARVESTEA—Benj Holt, Stockton, Cal.

483,455.—FLUME GATE—S. M. Irvin, San Bernardino, Cal.

483,384.—CHIMNEY CAP—J. Keane, S. F.

483,473.—LOCOMOTIVE STEAM BOILEA—G. J. Perkins, Truckee, Cal.

483,514.—HORSE-HITCHING DEVICE—J. H. Quinton, Portland, Or.

483,389.—REEL SUPPORT—F. S. Reeger, Germentown, Cal.

483,312.—CONTINUOUS FILR OR INDEX—A. J. Rudolph, S. F.

484,313.—LIBEAAY CATALOGUE—A.J. Rudolph, S. F.

483,173.—FLOOA SCAAPRA—F. C. Schroeder, Alameda, Cal.

The following brief list by telegraph, for Oct. 4, will appear more complete on receipt of mail advices:

Oscar W. Beach, South Riverside, Cal., vehicle axle; Harry J. Bennett, San Francisco, broom guard; Joseph R. S. Birch, San Diego, cigar lighter; Adam E. Chodzko, san Francisco, rock drilling machinery; Edward Ferris, Alta, Cal., machine for reducing the brasses of journals; Amasa P. Flaglor, San Francisco, device for modifying and controlling the rays of light for photographic purposes; Horace H. Fisk, Florence, Or., barrel stand; John H. McDade, San Frandisco, coin operated opera glass receptacle; Albert Minnlnck, Colton, Cal., ventilating device for railway cars; James W. Mollere, San Francisco, electro-therapeutical instrument; William G. Murphy Jr., Marysville, Cal., electric railway; Walter B. Noyes, San Francisco, folding bed; William A. Peters, San Francisco, apparatus for making malt; George W. Scott, Santa Rosa, Cal., hinge-seat cutter; Charles Smart, San Francisco, sanitary seal for covers of toilet vessels; Stephen F. Tuver, Puyallup, Wash., window shade supporter; Henry Vayre, San Francisco, awning; Charles Vogel, San Anselmo, Cal., grip for cable railways, two patents; Russell Whitman, Oakland, harness saddle pad.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TRAVELING HARVESTER.—Benjamin Holt, Stockton. No. 483,449. Dated Sept. 27, 1892. The invention in this apperetus designed to cnt, thrash, clean end sack grain consists in so constructing it as to enable it to travel upon sidehills and maintain the body of the thrashing and cleaning machine in a horizontal position and the wheels in a vertical position at all times whatever may be the inclination or variation of inclination of the ground npon which the mechine is working. The object is to enable a traveling harvester and thrasher to be used upon sidehills of any description and maintain the frame of the thrasher and cleaner at all times in a horizontal position and at the same time meintain the bearing-wheels in a vertical plane. It has also for its object the application of a suitable simple mechanism by which the position of the bearing-wheels reletive to the frame may be changed to suit the varying declivities over which the machine will pass.

AXLE-LUBRIOATOA.—John Q. Finch, S. F., assignor of one-third to A. W. Sanborn. No. 482,918. Dated Sept. 20, 1892. This device, which the inventor terms "a car-axle and bearing lubricator," is especially adapted to bearings where the weight rests upon the horizontel rotating shaft or axle, es in the case of cer-axles. The object is to supply the lubricant to the journal while the latter is in motion, and to have the feed cease when the journal ceases its motion. The inventor employs one or more coils or spirals, made of fine wire twisted into a small cord or etrand, this cord being then wound into the form of a spiral. This spiral is placed in the oil-box beneath the axle. The upper end of the spiral or cord is kept in contact with the lower part of the revolving axle or journal by the elasticity of the spiral pressing it upward. The effect of this is to agitete end cause a slight vibration of the spiral while the journal is in motion. The inventor says: "Practice has shown that with this motion a certain amount of the lubricsnt will be carried up partially hy capillary attraction, perhaps, and supplied in small quentities to the moving journal. As soon, however, es the journal ceases to move, the supply of oil ceases, and while I am not able, scientifically, to explain the operation of the device, the fact remeins, and the result is to feed the lubricant when the parts are in motion and to cease feeding when the parts stop, in which respect it differs from ordinary wicking or fibrous material, which feeds hy capillary attraction and feeds all the time, whether the journal he in motion or not. The device will not take up any dirt or foreign matter which is in the oil and thus become clogged and need cleaning, and hy reason of its rigidity and elasticity the upper end is kept in constant and yielding contact with the part to he lubricated."

FUMIOATOR.—Ferdinend A. Hoffman, Byron, Contra Costa Co. (Clara E. Hoffman, administratrix of said F. A. Hoffman, deceased). No. 483,484. Dated Sept. 27, 1892. This is one of that class of devices for exterminating small hurrowing animals, like gophers and groundsquirrels, and in which means are provided for generating end forcing noxious fumes end vapors into the holes. The object of the invention is to provide an exterminator of this class in which the fumes or vapors shall be generated freely and shall mingle with and load the air forced through them, whereby they are carried down into the holes or hurrows of the animels.

GRIP PULLEY.—A. S. Hallidie, S. F. No. 483,442. Dated Sept. 27, 1892. This invention relates to that class of pulleys known as "grip pulleys," and it consists of an improvement in construction hy which greater efficiency end portebility are obtained. The object of the invention is to construct the pulley of parts which can be separated so as to reduce a large pulley to small packages for transportation on mulehack or otherwise, which is necessary in mountainous localities where these gulleys ere frequently used.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 14.		WEEK ENDING Sept 21.		WEEK ENDING Sept. 28.		WEEK ENDING Oct 5.	
Alpha	.15	....	.25	.35	.30	.50	.30	.40
Alta	.20	.25	.25	.55	.40	.65	.30	.50
Andes	.35	.40	.45	.70	.55	.90	.55	.75
Belcher	1.15	1.80	1.70	3.20	3.10	6.50	2.95	4.50
Belle Isle	....	....	....	....	.15	....	.15	....
Best & Belcher	1.25	1.40	1.30	2.75	2.65	3.30	2.00	2.90
Bullion	.10	*.50	.45	.85	.65	.95	.80	.75
Bodie Con	.35	.40	.40	.45	.45	.60	.25	.40
Bulwer	.30	.35	.35	.35	.35	.50	.35	....
Commonwealth	.05	....	....	.05	....	.05	....	....
Con. Va. & Cal	3.15	3.35	3.10	4.20	3.65	5.00	3.80	4.50
Challenge	.35	.40	.35	.55	.70	1.50	.80	1.05
Chollar	.55	.65	.60	1.15	1.00	1.60	.80	1.40
Confidence	1.05	*1.60	2.25	3.25	3.00	3.50	1.35	2.50
Con. Imperial	....	....	.05	....	.10	....	.05	.10
Caledonia	.20	....	.20	.35	.30	.45	.20	.30
Crown Point	.55	.70	.65	1.30	1.20	2.25	1.05	1.65
Crocker	.05	....	.10	....	.10	....	....	....
Del Monte	....	....	....	....	....	.05	....	....
Eureka Con	....	....	2.00	....	1.90	2.00	2.00	....
Exchequer	.20	....	.20	.35	.30	.40	.20	.30
Grand Prize	.05	....	....	....	....	....	....	....
Gould & Curry	.90	1.00	.95	1.50	1.30	2.00	1.15	2.00
Hale & Norcross	.90	*1.40	1.50	2.55	2.30	4.15	2.15	3.50
Julia	....	....	.10	....	.10	.20	.10	.15
Justice	.15	....	.20	.35	.30	.45	.20	.35
Kentuck	....	....	.15	.30	.25	.40	.15	.30
Lady Wash	....	....	.10	....	.15	.25	.10	.15
Mono	.15	....	.10	.15	.20	....	.15	....
Mexican	1.30	1.45	1.30	2.15	1.80	2.80	1.80	2.40
Navajo	.05	....	....	....	.15	....	.15	....
North Belle Isle	....	....	....	....	.05	....	.05	....
Nev. Queen	.10	....	....	.15	....	.10	.10	.15
Occidental	.30	....	.30	.50	.40	.55	.30	....
Ophir	2.30	2.45	2.30	3.20	2.95	4.05	2.75	3.40
Overman	.35	.45	.4	.95	.70	1.65	.70	1.15
Potosi	.60	.7	.85	1.15	.95	1.70	.80	1.45
Peerless	....	....	.10	....	.10	....	.05	.10
Peer	....	....	....	.15	....	....	....	....
Savage	.75	.90	.85	1.65	1.30	3.00	1.50	2.50
S. B. & M	.25	.30	.35	.75	.65	1.15	.55	.80
Sierra Nevada	1.60	2.10	1.75	2.60	2.20	3.00	1.90	2.50
Silver Hill	....	....	.10	.20	.20	.35	.20	.25
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.25	1.45	1.35	1.95	1.55	2.15	1.25	1.85
Utah	.30	.35	.35	.45	.35	65	.30	.45
Yellow Jacket	.60	.70	.60	1.15	1.00	1.85	.80	1 35

*Assessment added.

New Incorporations.

The following companies have heen incorporated, and papers filed in the office of the Superior Conrt, Department 10, San Francisco:

WEST SHORE LANN CO. Capital stock, $50,000. Directors—Hermenn Zedig, Edward K. Chapmen, William Nicol, D. P. Belknap, S. Eppstein.

UNION LITHOGRAPH Co. Capital stock, $51,000. Directors—J. C. Hall, S. H. Strife, William W. Carter, E. M. Hall, W. K. Smith.

THE S. F. WREKS Co. Capital stock, $100,000. Directors—S. F. Weeks, James R. Watson, Albert B. Emerson, S. F. Weeks, Jr., end Joseph C. Cæsar.

CALIFORNIA KINDERGARTEN TRAINING SCHOOL. Capital stock, $1000. Directors—Nora A. Smith, Helen E. Bradhury, Mary P. Light, Kate Donglas Wiggin, Horatio Stebbins.

RIVEESIDE, SAN BERNARDINO AND LOS ANGELES R. R. Co. Capital stock, $2,000,000. Directors—D. S. Dorn, Samuel Miller, hoth of this city; M. H. Sherman of Arizona, R. J. Davis of Alameda. The object is to build a standard-gauge road on the following route: Commencing et the Morengo pass, near the city of San Bernardino; thence to Colton; thence to Riverside and thence by a route not yet selected to Los Angeles.

WOONY CONS. M. & M. Co. (Denver). To mine in Pitkin Co., Col. Capital stock, $2,000,000. Directors—J. J. Yeckel, B. D. Spencer, E. C. Simpson, J. J. Engelbarts and J. G. Fleming.

BULL HILL MINING Co. (Denver). Capital stock, $1,000,000. Directors—J. S. Johnston, A. S. Tyler, A. G. Chalmers, M. W. Smith, W. D. Combs, G. W. Dickinson and G. G. Shaver.

Market Reports.

Local Markets.

SAN FRANCISCO, Oct. 6, 1892.

General trade the past week has been only moderately fair for the season of the year. Trade continues to be dominated by a spirit of conservatism and from this well-beaten path large, and as for that, small dealers also, do not depart unless under exceptional inducements. The general tenor of information is of a very favorable character, and that confidence is developing in several branches of trade. Eastern mail advices are more favorable for an enlarging demand and improvement in several branches of trade. The improvement which is setting in appears to be more the result of a legitimate demand than of a speculative character, and therefore it will be apt to develop into larger proportions. The first decided improvement was noticed with woolen manufactures, and now the iron industry is falling into line. All leading and shrewd financial and commercial men accept the iron industry as a barometer to trade.

The local money market is reported quite active, with no trouble met in placing funds at 6 per cent. The demand for money is chiefly from mercantile circles and also for advances on warehoused grain. So far as we are able to learn, there is an absence of a demand for speculative purposes, it being with few exceptions for legitimate trade purposes. Remittances from the country are only fair, but with a further improvement in the market for wheat, considerable sums which are now tied up in that cereal will be unlocked and find their way back to the general reservoir. The decision of the U. S. Circuit Court in favor of hydraulic-mining, when the debris can be safely impounded, is accepted with much satisfaction, and gives promise to that greatly-abused industry forging ahead in the near future. With the rehabilitation of the industry, mining will again come to the front in this State.

Eastern mail advices continue to report an active money market with a free demand for funds from the central and southern States. The improvement in the market value for both cotton and wheat, with woolen manufacturers running on full time, and pig iron stiffening, is a more favorable outlook for the future than there has been at any time within the past three years. New York exchanges say the bank statements show a decrease in loans which are regarded by some as indicating a contraction of general business. This brought out the explanation that foreign bankers had taken advantage of the advance in the rates for money, particularly on time, by selling sterling bills short, or practically for the account of their foreign correspondent, and loaning the proceeds in the New York market. In this way a large amount of foreign capital, popularly estimated at from $8 000,000 to $10 000,000, had been loaned to those who had previously been borrowing of the banks.

The International Monetary Conference continues to attract attention, and, now that the conference has been called to meet at Brussels on November 22d, the interest will increase. The conference which met a few years ago did not attract such deep and widespread interest as does this. In consequence of this interest, the silver problem has met with a freer and fuller discussion, pro and con, than ever before. Under this discussion, it looks very much as if bimetallism had been strengthened. There can be no doubt but general trade stagnation the world over, combined with failures in the gold-standard countries, has materially assisted in promoting a better understanding of the financial situation and given strength to the movement for remonetizing silver. A Washington telegram says that the Powers which will be represented are Austria, Hungary, Belgium, Denmark, France, Germany, Great Britain, Greece, Italy, Netherlands, Portugal, Roumania, Russia, Servia, Spain, Sweden Norway and Switzerland. The delegates from the United States are Senators Allison and Jones, Congressman McCreery, Henry W. Cannon of New York and F. A. Walker of Massachusetts. It is expected Minister Terrill at Brussels will be made a delegate. The *Journal of Finance's* cab'egram from London says: "The Director of the Bank of England says there is certain to be consequential results for the whole world growing out of the coming monetary conference. This same authority avers that England and the United States will stand together in favor of the monetzation scheme for silver, which will give a largely increased volume of currency under conditions which will guarantee safety. It is rumored there are very marked differences of opinion touching the matter in Bank of England circles."

SILVER—The market has made a slight advance with a seemingly strong tone at the close. The strength of the market appears to be the natural result of a growing scarcity of the metal, which fact is being forcibly brought out by the prominence given to the discussion of bimetallism as the time draws near for the meeting of the monetary conference. Another factor is also contributing to the strength of the market, viz., a gradual improvement in several branches of trade at home and abroad and multiplying signs of returning confidence. With renewed activity in general trade the world over, a return of confidence and greater tendency toward speculation, it will most unquestionably be found that the gold standard will not meet the world's requirements, owing to the small supply of gold compared with the volume of trade and metallic-money requirements in more active times. Advices continue to come to hand of silver mines shutting down.

MEXICAN DOLLARS—The market appears to have a stronger tone, in sympathy with silver, at around 67¼ cts.

QUICKSILVER—Receipts the past week aggregate 401 flasks by coast, rail and 150 flasks of domestic reshipped from Sydney. The exports by sea aggregated 144 flasks to Mexico. The market is easy at a shading in prices. It is said that some outside parcels are obtainable at concessions on trust prices.

LIME—Receipts the past week aggregate 3771 bbls. The market is irregular at $1.25@1.50 per bbl. The demand is reported as only fair.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2,	Oct 6, Oct 27	C E Elliott, 3 9 Montgomery
Belle Isle M Co, Nevada	15	1c	Aug 22,	Sept 26, Oct 20	J W Pew, 310 Pine
Best & Belcher M Co, Nevada	52	25c	Aug 17,	Sept 22, Oct 13	L Osborn 309 Montgomery
Brunswick Cons G M Co, Cal fornia	4	30c	Sept 29,	Oct 31, Nov 17	J Sh a feld Jr, 3 9 Montgomery
Challenge Cons M Co, Nevada	12	10c	Aug 24,	Sept 27, Oct 18	C L McCoy 331 Pine
Commonwealth Cons M Co, Nev'a	9	10c	Sept 7,	Oct 15, Nov 9	R R Grayson, 336 Pine
Cons Pacific M Co, California	14	10c	Sept 29,	Nov 5, Nov 30	F E Luly, 339 Pine
Crocker M Co, Arizona	12	5c	Aug 11,	Sept 20, Oct 18	A Waterman 3 9 Montgomery
Crown Point M Co, Nevada	58	5c	Sept 15,	Oct 20 Nov 10	J Newlands, 331 Pine
Darbee Blue Gravel Co, California	1o	10c	Sept 14,	Oct 17, Nov 7	T Wetzel 320 Sansome
Eureka C n Drift M Co, California	5	0c	Sept 19,	Oct 24, N v 14	D M Kent, 330 Pine
Evening Star M Co, California	5	1c	Aug 19,	Sept 21, Oct 8	J J Scoville 320 Sansome
Gray Eagle M Co, California	20	5c	Sept 28,	Oct 31, Nov. 21	A W Barrows, 303 Cal fornia
Guascaran & California M Co, Honduras	7	$1.50	Aug 9,	Sept 15, Oct 8	E Oliver, 72 Mint Avenue
Independence M Co, Nevada	17	5c	Aug 15,	Sept 19, Oct 13	J W Pew, 3 0 Pine
Ingo Marble Co, California	18	50c	Sept 2,	Oct 22, Dec 1	A F Thane, 137 Montgomery
Jack Rabbit M Co, Nevada	1	5c	Sept 17	Oct 19, Nov 8	T Wetzel, 320 Sansome
Kentuck Cons M Co, Nevada	5	10c	Oct 3,	Nov 8, Nov 23	J W Pew, 310 Pine
Keystone Con M Co, California	3	$1	Aug 22,	Sept 26, Oct 18	J H Isham, 310 Pine
Mono M Co, California	32	25c	Sept 15,	Oct 24, Nov 14	H D Walker, 3 9 Montgomery
Navajo M Co, Nevada	22	10c	Aug 17,	Sept 21, Oct 14	J W Pew, 310 Pine
North Belle Isle M Co, Nevada	70	10c	Sept 1,	Oct 6, Nov 7	J W Pew, 310 Pine
Northwestern G M Co, British Columbia	5	20c	Aug 17,	Sept 25, Oct 15	F Bonaelna, 438 California
Silver King M Co, Arizona	9	25c	Aug 26,	Oct 7, Nov 4	J W Pew, 3 0 Pine
Teresa M Co, Mexico	8	10c	Aug 19,	Sept 22, Oct 8	K J Willats, 809 Market
Yellow Jacket M Co, Nevada	52	25c	Sept 5	Oct 7, Nov 11	W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Cons Cal & Va M Co, Nevada	Annual	A W Havens, 3 9 Montgomery	Oct 17
Eureka Cons M Co, Nevada	Annual	H P Bush, 216 Bush	Oct 17
Exchequer M Co, Nevada	Annual	C E Elliott, 3 9 Montgomery	Oct 17
Idlewild M Co	Annual	E F Stone, 306 Pine	Oct 12
Mayflower Gravel M Co, California	Annual	D M Kent, 330 Pine	Oct 17

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	10	L O h rne, 3 9 Montgomery	April 28
Champion M Co, California	10	T Wetzel, 310 Pine	Sept 19
Cons Cal & Virginia M Co, Nevada	50	A W Havens, 309 Montgomery	Aug 31
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	8 pt 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

ANTIMONY—The market continues to rule in buyers' favor. New York mail advices quote as follows: 10c for Hallett's, 11c for LX, 11¼c for Crown and 11¾@12c for Cookson's in round parcels.

PIG LEAD—The market is barely steady. Eastern mail advices report a fairly active market for pig at 4 cts in New York for round parcels, but at over $4.05 per 100 lbs, buyers do not take hold.

PIG TIN—Imports the past week aggregate 654 pigs from Australia. Our market continues to rule steady, with supplies well in hand. The demand is good for the season. The strengthening of silver has slightly improved pig tin abroad; with further advances in silver, it is thought that tin will also appreciate. Tin plate is easy and inactive.

PIG IRON—The low price ($19 to $20 per ton) at which American is put on this market operates very materially against the foreign product. The consumption, outside of shipbuilding and for railroad purposes, is said to be light. Eastern mail advices report that the markets are working into better shape for the selling interest. The advance of 25 cents by southern ironmakers had restricted orders, but it is thought that this is only temporary and would be followed by heavy purchases.

COPPER—Exports the past week aggregate 110,755 pounds of matte to New York. The markets abroad and at the East have advanced under a freer demand and stronger bolding. At present very little confidence is placed in the advance.

COAL—Imports the past week aggregate as follows: Cardiff, 8834 tons; Coos Bay, 450; Tacoma, 7106; Departure Bay, 3408; Newcastle, N. S. W., 3760; Baltimore, $3000; total, 26,558 tons. The market is reported stronger at an advance of about 25 cents per ton for the foreign on spot and to arrive. It is reported that about all the foreign coal on the way cared for, gives a better tone to the market, which is strengthened still further by the strong tone of the freight markets abroad.

San Francisco Metal and Coal Market.

ANTIMONY.			**STEEL.**		
Per lb	— @	13½	English, lb	— @	18
BORAX.			Canton tool	— @	8½
Refined, in car lots	@	7½	Sl'k Diam'd tool	8½@	12
Powdered, do	— @	7½	Pick & Hammer	7½@	10
Concentrat'd, do	— @	6½	Machinery	4 @	5
All grades jobbing at advance.			Toe Calk	— @	4½
COPPER			**TINPLATE.**		
Bolt	22 @	—	B. V. steel grade		
Sheathing	22 @	—	14x20, spot	— @	5 87½
Ingot, jobbing	@	14½	Charcoal, 14x20	@	5 87½
Do, wholesale	@	13½	Do roofing, 14x20	— @	5 87½
Fire Box Sheets	22 @	24	Do, do, 20x28	— @	11 76
IRON.			**PIG TIN.**		
Bar, base	— @	3	Spot	— @	23
Norway, base	— @	4½	**COAL.**		
PIG IRON.			**SPOT FROM YARD—PER TON**		
	Spot.		Wellington		$8 00
Eglinton, ton	22 00@	—	Greta		7 00
Glengarnock	23 00@	—	Nanaimo		6 00
Am. Soft, No. 1	24 00@	—	Gilmar		6 00
Oregon Pig	—@	—	Seattle		6 50
Puget Sound	—@	—	Coos Bay		5 50
Clay Lane White	24 00@	—	Cannel		9 00
Langloan	22 00@	—	Egg hard		12 00
Thorneliffe	23 00@	—	Cumberland, in sacks		16 00
Cartsherrie	22 00@	—	Do, bulk		14 00
Barrow	22 00@	—	Wallsend		7 25
Cavendish	22 00@	—	Scotch Splint		7 25
CHROME IRON ORE.			Brymbo		7 00
Per ton	40 00 @	—	West Hartley		7 50
LEAD.			**TO LOAD—PER TON.**		
Pig	— @	4½	Australian	6 00@	—
Bar	— @	5½	Liverpool Steam	6 25@	—
Sheet	— @	7	Scotch Splint	6 25@	—
Pipe	— @	6½	Cardiff	6 50@	—
SHOT.			Lehigh Lump	15 00@	—
Drop, sizes smaller than B, bag of 25 lbs	$1 85		Cumberland	13 00@	—
Do do, B and larger sizes bag of 25 lbs	2 10		Egg, hard	11 00@	—
Buck, Balls and Chilled do, bag of 25 lbs	2 10		West Hartley	7 00@	—
QUICKSILVER.			**COKE.**		
Home trade, per flask	41 00 @41 50		English, to load	28 00@	9 00
For export	35 00 @35 50		Do, spot, in bulk	—@	10 00
			Do, in sacks	—@	12 00
			Cumberland	9 00@	—

Eastern Metal Markets.

NEW YORK, Oct. 5.—The following are the closing prices the past week:

	Silver in Londom	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38¼	83¼	10 90	4 00	20 25
Friday	38¼	83	10 20	4 00	20 35
Saturday	38¼	83	10 90	4 00	20 40
Monday	38¼	83	11 05	4 00	20 45
Tuesday	38 3-16	83¼	11 15	4 00	20 30
Wednesday	38¼	83¾	11 15	4 00	20 30

The market is easy at lower prices for quicksilver, in sympathy with a decline abroad. Borax is strong, with a good demand reported. Pig tin is steady. Copper is stronger at a slight advance. Lead is fairly steady.

Mining Share Market.

SAN FRANCISCO, Oct. 6, 1892.

Mining shares the past week were active at declining prices up to Monday, when a steadier tone set in, which has since been followed by firmer prices, with the upmove chiefly in the north-end shares, under the lead of Con. Virginia. On last Saturday there was a decided break with Belcher, after the regular call selling down to $2.60 per share, against sales on Tuesday, Sept. 27th, at $6 50. Other south-end shares suffered proportionately. The drop ended with the usual result—uncovering of margins and heavy financial losses to bulls, but patrons of the PRESS who heeded our remarks in the issue of Sept. 5th—at which date Belcher shares were selling at around $1—made money. The remarks then made will bear reproduction, for they apply with equal force now that they did at that time. We then said: "The lessons of the past have made it a certainty that when a sufficient number of gudgeons buy on promises which are as unlikely to prove true as that a pot of gold will be found at the end of the rainbow, they will find it is a down market, with assessments until the outside is frozen out and the rings get the shares for a great deal less than the collected assessments aggregate. It is time enough for the public to take a hand at the game when there is a prospect of the mines being worked and the ore milled according to the laws under which the companies incorporated. The inside ostrich trick of hiding the head while exposing the body, does not deceive, and until they put others to the front, as relormers, than those who have been closely connected with the rings, the public bad better keep a close eye to the windward. The writer will place bimself on record, as he has repeatedly done, on the upmoves made within the past five years, by affirming that when the rings have peddled out a sufficient number of shares, there will follow the usual low range of values—60 to 80 per cent below the highest figures reached. Of course, the old stale cry of big bonanzas and something big near at hand in the share market will be the allurements to keep gudgeons, when in the net, from pocketing what loss or profit, as the case may be, they have met, and not take the certainty of heavy losses. While raising a warning cry at this early day against the game as now theivingly carried on, yet the writer thinks that the ring will have to send the market somewbat bigber before it can induce gudgeons, through their cappers and paid newspaper writers, to load up."

Time proved the correctness of the above prediction, and time will again prove that the present upmove, which we appear to have entered on, will be more disastrous to the bull interests than has followed any upmove since 1887. What tactics insiders will adopt to get the public to load up, the writer does not pretend to know, but that they have some kind of a devilish game concocted goes without saying. Owing to our early warning regarding the last upmove, the rings did not succeed in accomplishing that which it looked as if they attempted, for although a number of outsiders were caught on the bull side, yet the majority not only sold the stock they were long on, but shorted the market and came out big winners. It now looks as if the outsider who keeps cool and does not fear that the market will go skyward, will again have an opportunity of making money by selling; but this time it will probably be more difficult than ever to resist the temptation of buying and holding shares.

Everything now indicates that the inside wants to put out one or more lines of assessments this winter, which they want outsiders to pay on the usual rainbow promises of dividends and big things in the sweet by-and-by.

Our advices from Virginia report that H. M. Levy had arrived on the Comstock lode. It is said that his arrival and also that of J. L. Flood, had given rise to reports that they were in Virginia to look after the reported stealings from the milling of Savage ore. It is said that Mr. Levy is as much interested in the Comstock mines as ever before, but not now openly. It is a great game, this, of working the Comstock mines.

If the directors of the Savage Mining Co. desire to free themselves from even the suspicion of collusion with the mill rings, they will either buy or lease a mill or let the contract for milling the ore to the person who made so favorable an offer. The person is entirely responsible and would return the bullion to the Company for dividends, instead of, as report says is now done, to a mill ring or rings for dividing among the members.

The Quijotoa companies have lately been collecting assessments, and it seems as if Mr. Lyle, president of several of them, could not resist the temptation of visiting the mines. The only result the writer can see that has come from former visits of Mr. Lyle to the mines, has been the decreasing of the money collected for assessments. It is said that Mr. Wells, the reformer, is the legal adviser for the Quijotoa companies.

The share market this (Thursday) morning opened inactive, but with a firm tone. After regular Call, the market was irregular but its general action indicated that Bob Morrow's brokers were taking in shares. Whether the buying is preliminary for an upmove it is hard to say, but it looks as if it is, but for how much each reader must be the judge.

Con Virginia's bullion output in last month aggregated over $78,000. There was a large increase in the percentage of gold.

News from the Comstock mines is to the effect that in the Gold Hill group more men are to be put to work. It is also said that enough water will soon be flowing down the Carson river to admit of starting up the mills on ore which has accumulated in several of the mines. It is said that while in Virginia J. L. Flood instructed the superintendent of the Con. Virginia mine to increase the ore assays. It is a great game this, of working the Comstock mines, provided the above is correct, by orders from Pine street. The last official letter from Belcher reports the starting of new work and more favorable indications encountered. In Overman, the work is quite important, as it is in Kentuck, Crown Point, Jacket and other Gold Hill mines, but much of it is still kept back. Perhaps this is done to induce buying when made public later on. What outsiders will get out of the bullion from any of these mines, under the present milling system, is not likely to stay a hungry stomach, let alone putting any money in the purse. The work under way in Hale & Norcross is being closely watched, as is that in several of the north-end mines. Probably the watching is all that will come out of it. There is no doubt but several of the mines can be worked so as to pay dividends, but it looks as if they will not until more rigid measures are brought to bear against the demurring directors to have the mines worked and ore milled for the benefit of outsiders as well. It is now said to be done for inside rings.

A Successful Concentrating Belt.

It will be seen by the new "ad." of the Blasdel Concentrating Belt Co. that they are now manufacturing, in addition to their riffled belts, smooth ones with their Blasdel Patent Flanges. These patent flanges have already demonstrated their many advantages over the edges heretofore used on concentrating belts, as they conform to the change of direction in passing over the end rollers without breaking; thus they avoid the nuisance of frequent stoppage of machines to repair the flanges. One can only wonder why a device so simple, yet so efficient, has not been invented before. The company are now arranging to introduce their belts in all the mineral States and Territories. Further particulars may be had by addressing H. G. Blasdel, Jr., Manager, No. 419 California St., San Francisco.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

DELINQUENT SALE NOTICE.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of Works, Amador City, Amador County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 22d day of August, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
John S. Hager	11	233	$233 00
John S. Hager	130	100	100 00
M. J. McDonald	137	500	500 00
E. D. Rue, Trustee	138	926	9 6 00

And in accordance with law, and an order of the Board of Directors, made on the 22d day of August, 1892, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 310 Pine St., Room 43, San Francisco, California, on TUESDAY, the 18th day of October, 1892, at the hour of 12 o'clock M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. H. ISHAM, Secretary.

Office, 310 Pine St., room 43, San Francisco, Cal.

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W. N. JEHU, Manager.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST BORAX COMPANY, San Francisco, Sept. 30, 1892. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 22) of One Dollar ($1.00) per share was declared, payable MONDAY, October 16, 1892, at the office of the company, No. 101 Sansome Street, Room 26. Transfer books will close October 5, 1892, at 3 o'clock, P. M.

ALTON H. CLOUGH, Secretary.

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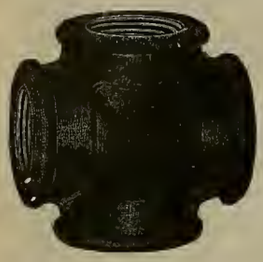

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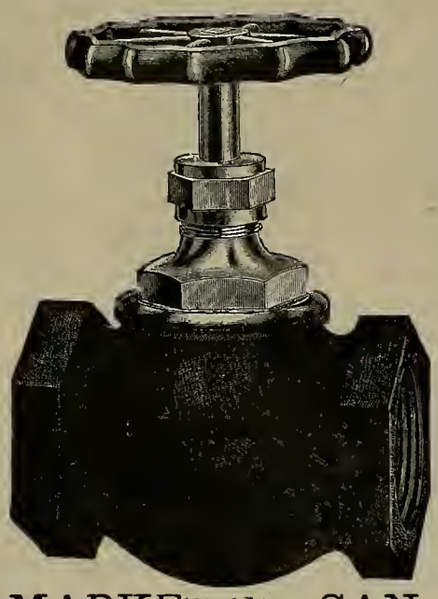

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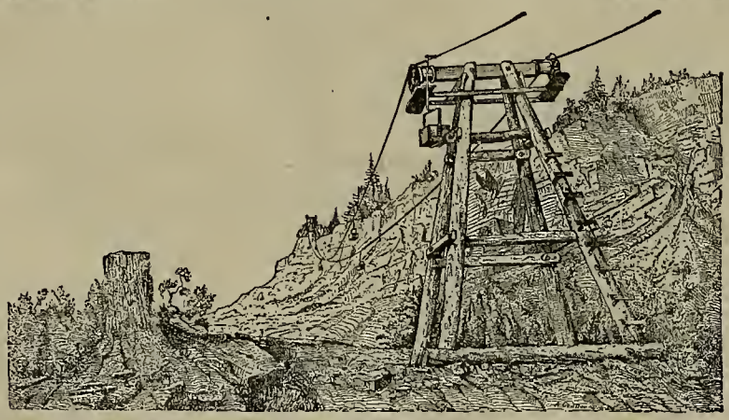

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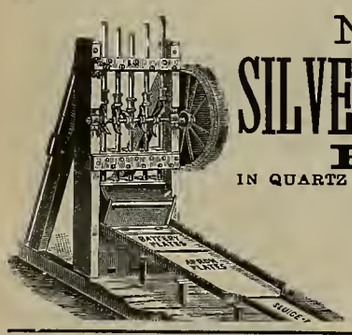

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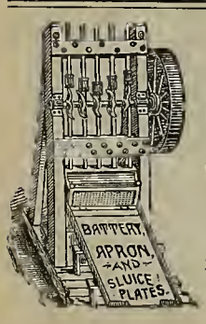

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MINING AND SCIENTIFIC PRESS.

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VOL. LXV. — Number 16.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, OCTOBER 15, 1892.

Three Dollars per Annum
SINGLE COPIES, 10 CENTS.

Undeveloped Prospects Not Salable.

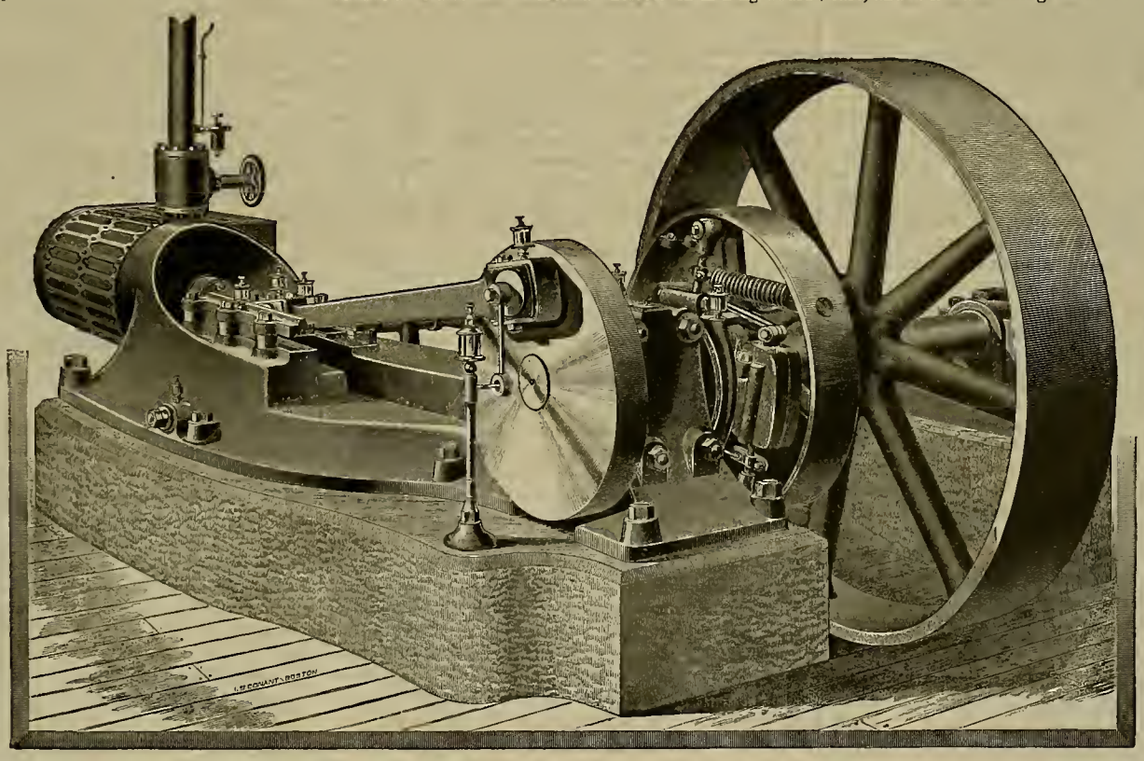
In glancing over our exchanges we frequently see mention of new strikes in old mines and claims that have been suffered to lie idle for years, when taken hold of by some man on a possibility that they may prove of value. Some of our best paying mines are those that bave been suffered to lie idle for want of faith in them or want of capital to carry the work to a point to determine their value. There are hundreds of such claims all over the State that the owners have suffered to go by default or doing only sufficient work to comply with the law, thereby enabling them to be held; the owners continuing to hold them in the hope that some man with money may come along and purchase. Thus these undeveloped claims are held from year to year for the purchaser that never comes. This is a mistaken policy as purchasers are not likely to see sufficient development to justify giving attention to what might with a few months work by the owner open up a claim to a point to determine the question of its future possibilities. It is a mistaken idea that a purchaser can be found willing to take all the chances and risk, whereas a certain amount of work might show some prospective value which can never be determined as long as the claim is suffered to lie idle.

The owner himself is equally ignorant of the value of his claim and is often doubtful whether it has any real value. He is not likely to meet with any experienced miner or capitalist having any greater faith in the soslightly developed property than he has himself; hence the only way to settle the question for his own satisfaction and put it in marketable shape is to do the necessary work to determine whether it is worth doing assessment work.

We believe that if the owners of mining claims and prospects, instead of waiting for some thing to turn up or the purchaser who never comes, would go to work earnestly to develop their prospects we should have more instances of old and abandoned claims coming to the front. There are probably as many good mines at present valueless for want of such development unknown and unheralded as are now in profitable operation all of which were in this condition of doubt and uncertainty until such labor as we recommend was done upon them.

The complaint of the general dullness and apathy in the old mining districts is as much the fault of the miners owning claims as the indifference of capitalists. In fact it is an error to say that the capitalists are indifferent for at this moment there is an abundance of capital awaiting investment in mines, but the proposed investor cannot be induced to take up a property in its undeveloped condition.

In urging upon owners of mines we do not advocate the outlay of capital beyond the actual labor of their own hands which is all sufficient to soon determine whether it would be justifiable to hire additional labor. There is sufficient idle capital at present in this city to invest in mines showing a prospect of future value to justify every miner having a claim which he believes only needs development to be valuable to go to work on it with an almost certain chance of finding a purchaser. It will be found that purchasers are more numerous than is at present supposed, but such investors will not assume the initiative and do the preliminary work; that tbe miner and owner must do if he ever expects to realize a dollar for his claim. We believe an era of most successful interest in mining would be inaugurated if this suggestion was adopted and there would be no more complaints of apathy on the part of capitalists in mining investments. It is difficult for the capitalist here at the present time to realize more than 6 per cent for his money. He will be glad to invest his capital in mines that will pay him 10 or 15 per cent per annum. It is the miners part now to furnish him the mine; hence we say again to the miners go to work and develop your claims.



GIDDING'S AUTOMATIC CUT-OFF ENGINE, PORTER TYPE OF BED.

THE Witwatersrand (South Africa) gold output for August is reported at 102,322 ounces, as against 59,070 ounces in 1890. This product, while a gain of 1042 ounces on the July output, is a loss of 678 ounces on the June output. The output for the eight months ending with August aggregated 705,747 ounces, as against 437 114 ounces in 1891 for the like period, or a gain of 61½ per cent. The estimated value of the eight months' output is $13,209,136.

THERE is great excitement in Valparaiso over the reported discovery of heavy placers of gold on an island in the Terra del Fuego.

High-Speed Automatic Cut-Off Engines.

In the Giddings medium, high-speed automatic cut-off engines made in Sioux city, Iowa, and for which the Park & Lacy Co., of this city, are coast agents, one of the principal features is the "equilibrium" slide valve. This valve consists of one piece, takes steam from underneath, supplies the cylinder through double ports, giving twice the usual port area, and close approximation to boiler pressure. Is self-adjusting to wear and position, and free to lift from its seat, sufficient to relieve the cylinder of water. Equilibrium is obtained by two needle ports in brass plugs in the top-edge of valve, one supplying live steam to the back of valve to avoid lifting, another connecting with exhaust passage, thereby preventing accumulation of pressure, and still maintaining about two pounds of surplus pressure per square inch on back of the valve, which insures a positive and permanent tight joint. The connection is made by a hinge joint whereby the valve can be opened outward like a door without disconnecting.

The Giddings automatic cut-off governor, while similar in general appearance, possesses several advantages over other shaft governors, having a greater degree of stability, and capable of the closest regulation. Its construction consists of two eccentrics; the auxiliary eccentric rotating on the hub of the governor disc by the usual system of weight-arms and levers. This eccentric has a cross-head strap which gives a motion square across the shaft, preserving a constant lead. The main eccentric fits over this cross-head by means of lugs, and its throw is varied hy the movements of the same, thereby changing the travel of the valve to give the required port opening for varying loads and boiler pressures, at the same time preserving an *absolute* uniformity of motion. This combination of two eccentrics gives the greatest possible degree of stability, as it is mechanically locked in every position.

In design, these engines possess a great degree of stiffness and rigidity, insuring perfect alignment, and consequent light-running, and by reason of the valve used, they are economical engines. Nothing hut the best of material is used, and the workmanship is excellent.

CLARENCE L. COLEY has been appointed assistant professor in the department of mechanics at the University of California at a salary of $2000 for one year.

SOUTH MOUNTAIN will be one of the leading camps of Idaho when it has railroad communication.

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W. B. EWER, CHAS. G. YALE, } .....EDITORS
ALFRED HOLMAN.....MANAGER

Entered at the S. F. Postoffice as Second-Class Mail Matter.

Our latest forms go to press on Thursday evening.

San Francisco, Saturday, October 15, 1892.

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Comment.

The establishment of a trading station on the upper Yukon river, Alaska, is an important thing for the miners and is the cause of many remaining this winter at their claims instead of returning home as usual. The high price of provisions in inland Alaska during winter has been a great drawback to the mining industry. Flour used to cost $15 to $18 a sack and nothing less than $10 a day diggings were worth bothering with. Chicago capitalists recently organized a company for opening placer fields on the upper Yukon and they have established a trading station at Upper Ramparts, 2000 miles from the mouth of the river. Flour will be sold at $3 per sack and other things in proportion. The comparatively low prices have induced many miners to remain at their claims for the winter, saving the long trip back to the coast. The company which has established this new station has taken improved machinery in to work its own mines. It will send in next spring about $15,000 worth of machinery and provisions. Several hundred men will also be sent into the various mining claims owned by the company, which is known as the North American Transportation and Trading Co.

CHAS T. YERKES, the street-railway magnate, proposes to give to the Chicago University the largest telescope in the world—larger than the Lick, in this State. Alvan G Clark has, it is said, undertaken to make a 45-inch glass. The Lick is a 36-inch aperture refractor, and Clark has since made a 40-inch glass. These large glasses can be made now much cheaper than when that for the Lick telescope was cast. Mr. Yerkes expects to get his telescope for $500,000. The Lick Observatory cost $700,000, including the buildings. It will take several years to cast, grind, polish and finish the proposed glass, and it is not likely that it will, when finished and set up at Chicago, be able to accomplish the work the Lick does here. The atmospheric conditions at Chicago are very unfavorable for astronomical work. A large body of water at one side of an observatory is a great detriment in the first place, and the atmosphere of a great city is still worse. Chicago is, however, a city of big things, and the largest telescope in the world would be a first-rate advertisement, even if no specially startling results were accomplished with it.

Judge Hebbard has denied a motion for a new trial in the famous case of M. W. Fox vs. the Hale & Norcross Silver Mining Co. et al. In his opinion the court states its position as regards the defendants very clearly. He speaks of the defendants by name, and says that with the single exception of H. M. Levy, he does not believe that any one of these directors ever received a dollar's worth in value of the property diverted from the company. With the single exception of Mr. Levy, he believes they would have scorned a division of the spoils of the conspiracy in any amount whatever. "But," continues the court, "I am thoroughly satisfied that these same directors, by their gross carelessness and negligence, by the violation of the trust reposed in them by the stockholders of the company, and by the violation of the duty imposed upon them by law, allowed and permitted the other defendants to misappropriate the property of the corporation." No one not interested can well find fault with this decision. If these directors, by ignorance or negligence, levied unconscionable assessments and confirmed dishonest contracts of conspiring employes, by which the stockholders were robbed, they ought to be held responsible. This should have a salutary effect on changing the habits and customs of mining-company directors. They will be more careful in the future and find out exactly what they are doing at their meetings. The decision should also clear the moral atmosphere of the mining-stock dealings and give investors a better chance than they have had to get returns for their money.

The Bay and the Mines.

The San Francisco *Bulletin* does not think Judge Gilbert's decision in the North Bloomfield case will satisfy San Francisco, because the fine clay held in solution has been deposited in Suisun, San Pablo and San Francisco bays, north of this city. It confesses the channel has kept at mid-depth pretty well, but it has been narrowed and the bays filled up on either side, a process which will go on and decrease the tidal scour and eventually shoal the bar at the harbor mouth, damaging San Francisco bay. This is mere surmise on the *Bulletin's* part, because there is no evidence that the bar has shoaled at all, or that it will. As far as San Francisco being satisfied is concerned, this city has done as much filling of the bay as the miners have. There has been a constant mania for filling in. They first filled in Yerba Buena cove, the natural harbor of the city. They then filled in Mission bay, a large, fine cove, eminently adapted for shipping purposes of a great city; a place where ship and car could have come together. They are now filling in Islais creek cove or bay, the third of the three great indentations on the San Francisco peninsula. In front of the city proper, they shoved the seawall way out and filled behind that. Then the cove behind Black Point was filled in. Beyond, and extending to Fort Point, they are now filling in. The sandhills of the entire city have been dumped into the bay, a process which has been going on for 30 years, and still continues. For the people of this city to remonstrate against others dumping into the bay, after what they have done themselves, is laughable. There are no coves left for shelter from Fort Point to Hunter's Point. Every one has been spoiled. As a result, ships go to Port Costa, Martinez, Oakland and Saucelito, instead of laying-up here. This is all due to the filling-in process, which has destroyed the natural shelters. If decreasing the tidal scour is bad, San Francisco has done most of it thus far. As to the upper bays, north of the city, there never were any cities or towns along the shallow part of their shores. Wide flats extended out from the shores when this country was first settled, before mining commenced. The middle ground of Suisun bay existed then, as now. The flats have shoaled somewhat since then, and, as the *Bulletin* asserts, have widened, narrowing the main channels. But the Government spent some millions in narrowing just such channels at the mouth of the Mississippi, in order to deepen them. The same result has been accomplished here, at a profit; that is, working the mines and depositing the silt, narrowed and deepened the channels in the main San Pablo bay, the first northerly arm of San Francisco bay, and the most important, leading, as it does, to Mare Island Navy Yard and Port Costa. Thorough investigation of this subject, 10 years or more ago, by the Board of Trade of Vallejo, proved these facts.

There is a great deal of nonsense talked about the shoaling of the bay by people not familiar with it. There is a wide channel each side of Southamptoo shoal which lies between Raccoon straits and Red Rock, and which existed in 1849, before mining commenced. The shoal is no larger than it was then. But the Presidio shoal, off the north city front and extending down toward the Gate, has shoaled and enlarged. This shows that the decrease of tidal scour resulting from the filling operation around San Francisco has had an effect, since the waters from the south side of the bay flow down that channel. The waters from the main rivers of the State, where the mining comes down, flow to the sea, past Southampton shoals, through Raccoon straits and that part of the bay north of Alcatraz Island. Therefore, the shoaling of the lower bay is due more to the senseless filling in for 25-foot lots, than it is to mining operations, and in thus filling in, the bay, as a shelter for vessels, has been spoiled. The famous seawall as a place for discharging and loading vessels is first rate; but as a protection there is valueless. It is worse; it is a danger. The seawall to the north of the city is a dangerous place during northers; and southeasters will make the southern seawall bad when built. The Pacific Mail Steamship Co. has refused to move to the north seawall fearing to endanger its valuable steamships, and will move to Oakland rather than take the chances of a berth north of the city.

Nobody has said very much about this filling in of the coves about the peninsula, because it makes real estate which can be sold, and that makes business in San Francisco. But it is and has always been detrimental. Even now they are making these lots with garbage on Mission bay. All the filth of the city is dumped in. The stuff that flows from the sewers on the water front and sinks is dredged up and taken in barges to the anchorage in front of the city and there dumped. For 25 or 30 years these barges of the Harbor Commission have been daily dumping this mud and filth while keeping the wharf-slips deep. It all goes to the bottom of the bay and has helped extend the Presidio shoal.

And the *Bulletin* does not think Judge Gilbert's decision will satisfy San Francisco, because silt from the mines may shoal the bay. It has done no harm to navigation whatever. The mud flats were never used for anything—navigation nor building. The channels where the shipping goes have been deepened. Their width is of little moment, for in San Pablo bay the channel is a couple of miles wide even now. In the lower bays they remain the same.

If the State has any cause of complaint, it is against the city of San Francisco rather than mining or agricultural residents of the interior, although both have contributed to the material entering the lower bays. The bay south of the city has shoaled greatly in the last 40 years, but there are no mines there, and nothing but agricultural debris and natural brush enters it.

An immense area is drained by the Sacramento and San Joaquin rivers and their tributaries, and all this water must pass through the bay and Golden Gate to reach the sea. Nothing that man can do could stop this flow; it could not possibly be dammed back. And while the water flows it will cut channels to make its way. It is all foolishness to talk of the bay filling up. The bights between points are always shoal in any bay, though they are shoaler here than is usual. But the main channels remain as deep to-day as they were when the State was first settled by Americans, and the bar at the harbor mouth shows no radical change one way or another.

Comparative Cost of Carrying Passengers on Street Roads.

There is more or less discussion on the subject of comparative cost of carrying passengers on street railroads, by the different systems of power, the main rivalry being between cable and electric roads. One large city, at least, has an excellent opportunity of comparing practical results and that is Birmingham, England, where the Birmingham Central Tramways Co., limited, operates an extensive system. They own and operate steam roads, horse roads, cable roads and electric roads. A copy of the annual report of this company is at hand, and a perusal is of great interest. The directors say: "The subjoined statement of traffic and profit shows that the profits of the steam department have been naturally reduced by the charge for fuel and by repairs to engines. The electric department shows a loss, chiefly due to the heavy charges for renewal of batteries, but your directors now have under consideration a contract for maintenance of batteries which, it is hoped, will tend to material economy and profit of working. The cable department has again shown a gratifying result, and it is evident that upon miles of heavy traffic and severe gradients, no other system of traction at present in operation can compete with the steel rope."

An increase of revenue is desired, and to do this the company proposes to spend $300,000 in converting the Stratford-road line into a cable road.

We have not space for the complete report but will take such figures as illustrate the difference in cost of carrying passengers on the different systems. In the steam department the expenses, for engines, car repairs, traffic, permanent way and buildings, charges, etc., amount to $303,-859.41; passengers carried, 14,659,240. This makes a cost of 2.07 cents per passenger. Miles run, 1,212,624, which is 12.07 passengers to the mile run.

In the horse department the expenses were $131,681.89; passengers carried (both tramway and omnibus), 3,750,741. This makes the cost of carrying each passenger 3.50 cents. The miles run amounted to 634,551 and they carried 8.39 passengers per mile on the tramways and 5.25 passengers per mile on the omnibuses.

In the cable department the expenses for haulage,

cables, repairs, traffic, permanent way and buildings, general charges, etc, amounted to $80,003.12; passengers carried, 5,922 304; cost per passenger, 1 35 cents; miles run, 621,210; passeogers carried per mile, 9,53.

In the electric-road department the expenses for electric haulage, machinery, repairs, traffic, permanent way and buildings, general charges, etc., amounted to $60,508,91; passengers carried, 1,382,997; cost of carrying each passenger, 4 37 cents; miles run, 188,760; passengers carried per mile, 7.32.

These figures are from the official report of the company to the shareholders. They are not mere theory, but are based on the actual work of the year. According to these, the cost of carrying each passenger on each style of road is as follows:

	Cents.
Steam	2.07
Horse	3.50
Cable	1 35
Electricity	1 37

It must be admitted that this company has exceptional facilities for comparing the systems, since it has all four in use. The results speak for themselves, and will be read with interest by all street-railroad men.

Coast Industrial Notes.

THE Petaluma silk factory buildings have been completed.

THE bids for supplying the San Bernardino Insane Asylum with machinery and electrical apparatus were all rejected and will be readvertised.

MINING assessments falling delinquent this month amount to $109 000, of which Nevada mines want $55,500, California $28,500 and Arizona $25,000.

THE force at the Mare Island Navy Yard has been reduced something like a hundred men during the past two weeks, there being now but about 530 on the rolls.

THE Spreckels Brothers have expended about $400,000 on electric railways in San Diego, the system being 12 miles long. They now desire to build another branch on D. street, which will cost some $50,000 more.

THREE thousand two hundred and four acres have been subscribed to the Cooperative Sugar Factory at Anaheim. Deeds to 1700 acres have been handed into the corporation, and now the work of putting up the factory will begin.

THE Hueneme *Herald* says: Well No. 2 of the Sisar Oil Company is producing a large amount of gas, and there is every indication that it will soon yield a good supply of oil. The stock in this company is owned principally in Hueneme.

N. E. SAGER, of Redding, is in the city closing up a deal for $300,000 worth of Mendocino county timber lands. The purchasers are Chicago capitalists, who will probably put in some extensive sawmill plants to furnish redwood lumber for the Eastern markets.

THE large saw and shingle mill of Bothell Brothers, at Bothell, Wash., was burned on Saturday. Several hundred thousand shingles were also burned. The capacity of the mill had just been doubled. It employed 50 men and cut 100,000 shingles a day.

THE bids submitted for a large amount of dredging for the improvement of Olympia harbor and Swinomish slough were opened by Captain Symons, United States Engineer, at Portland, Or., last Saturday. The lowest bid was made by Gieger & Zabriskie of California, who propose to do the work at Olympia for 13 cents per cubic yard and at Swinomish for 16 cents per cubic yard. They operate a Hercules dredge.

THE Board of Trustees of Sacramento have granted a franchise to H. P. Livermore and Albert Gallatin of San Francisco to construct and operate an electric railway through the principal streets. Power is to be furnished from works at the State Prison at Folsom, a dam for which has been built in the American river at that place. The board also passed a franchise granting them the right to bring into Sacramento City by wire electric energy from the Folsom dam for lighting and motive-power purposes.

GRADING on the extension of the Metropolitan electric railway from First avenue and Carl street out I street to North avenue has been completed. Tracks have been laid as far as Fifth avenue, and but a short time will elapse until the road is finished to the terminus near the Olympic Club grounds. The Omnibus Cable Company has laid a 50-foot strip of double-track cable road on Carl street, between Willard and First avenues, sufficient to keep the terms of its franchise for a road out Carl street to First avenue..

THE San Francisco lumbermen interested in controlling the cargo output of the coast have prepared a schedule of the amount of lumber each mill may cut under the pool arrangement. The schedule is based upon the output of 1891, and is unsatisfactory to most of the small millowners, who may be subsidized, although it is not the plan now to subsidize mills. The new schedule, if made, may, instead of subsidizing, increase the output of small mills. It is held that $9 per 1000 can be secured just as readily as $7 per 1000, if the output can be controlled.

THE borax receipts in this market for September aggregated 242,900 pounds. The total receipts for the past nine months amounted to 1,276,909 pounds, as against 1,593,300 pounds in 1891, and 1,812,300 pounds for the same period in 1890. The returns of the exports in September have not yet been received, but in August they amounted to 1,057,994 pounds. The total exports for the past eight months amount to 8,955,013 pounds. In 1891, the exports for the first nine months of the year amounted to 9,327,003 pounds, as against 7,672,067 pounds in 1890.

Practical Work With the Cyanide Process at the Mercur Mill.

SALT LAKE CITY, UTAH, Oct. 7, 1892.

TO THE EDITOR:—On page 204 of your issue of September 24th inst., I find a report of a statement made by Prof. Morton at a meeting of the Shasta County Miners' Association, from which he seems to have fallen into error in regard to the working of the ores from the Mercur mine at the company's mill.

Because the representatives of the MacArthur-Forrest process, in Denver, stated in their report that it was the intention of this company to increase their capacity to 50 tons per day, he takes it for granted that they have done so and makes his deduction on that basis. This company, although it intends so to do in the close future, has not yet increased the mill capacity to 50 tons per day, and never has been in the habit of advertising its business, being satisfied with what is being done. Huwever, as a very wrong impression might prevail among mining and milling men, on reading a statement made by such a noted man as Prof. Morton, I deem it well, in justice to this compaoy and the MacArthur-Forrest process, to make the following statement:

The workings for the months of May, June, July and August were as follows:

	Tons del'd at M ll.	Battery Assay.	Tailings.	Net Extracted.	Per Cent.
May	880	$15.01	$2.67	$12.34	82
June	305	17.57	2 56	15.01	85½
July	402	17.50	2.85	14.65	82⅝
August	755	18.90	3 30	15.60	82⅝

By actual returns, per certificates received from the Omaha & Grant Smelting and Refining Co., and now in my possession, were as follows:

	Gold ozs.	Per oz.	Total Value.	Tons Milled.	Total Extracted.
May	413 74	$20.00	$ 8,274 80	880	$10.859.20
June	262.33	20.00	5,246.60	305	4.578.05
July	303.43	20.00	6,068.60	402	5,889.30
August	550.40	20.00	11,008.00	755	11,778.00
		Totals	$30,598.00	2342	$33.104.55
			Difference		$ 2,506.55

This difference is accounted for by gold still in solution and product left in the precipitating boxes, the result of ore put into tanks during August included in the tons milled; but as we do not make an absolute clean-up every month, there is always quite a lot of valuable product left over. The actual cost of mining and milling, including superintendency and royalty, is $5.60 per ton, so that 2342 tons worked cost $13 115.20, leaving a profit of $17,482.80, or $7.47 per ton.

This shows a net extraction of $13 07, or 77 per cent, by actual returns from the refinery. If a thorough clean-up had been made, this percentage would have been much higher.

The cost at present is excessive, as all the ore extracted and milled is obtained in development work, no stoping having been done thus far; consequently, as any miner will acknowledge, this class of work is the most expensive. By increasing the mill capacity to 50 tons the cost of milling will not be increased, as the same number of men as now employed can readily handle that quantity. When we get ready to stope, the cost of extracting the ore from the mine will be merely nominal. Yours respectfully,

R. L. SCANNELL,
Sec'y Mercur Gold Mining and Milling Co.
P. O. Box 870, Salt Lake City, Utah.

That White Powder.

SAN FRANCISCO, October 8, 1892.

TO THE EDITOR:—In view of the question recently raised by Mr. Aaron, as to whether the white powder formed from the contact of a cyanide solution with zinc might not be a source of loss, the following extract may be of interest. It is from a letter received by the writer from Mr. Gill S. Peyton, the manager of the Mercur mine.

"* * * We are not bothered at our mill (the Mercur) with this powder. At our Nevada plant we see the powder forming. I had some of it sent me, but only found a trace of gold in it, and made a test on the solution after it had passed through the zinc, and found only 80 cents a ton in it. * * *" C. W. MERRILL.

Personal.

DR. LUX and Mr. Wilbur have been visiting Downieville, Sierra County, on mining business.

R. G. HORN, the well-know stock broker and president of the Pacific Stock Exchange, has returned from Cincinnati.

HORACE D. RANLETT, the California coffee operator, is at present in New York, but will shortly return to San Francisco.

AT a special meeting of the directors of the Belcher Mining Company W. E Sharon was appointed assistant superintendent the mine.

CHRIS MALLON, Superintendent of the Delhi quartz mine, Nevada Co., says they are now putting in heavier machinery to handle the water, and cutting out a new station for the purpose of opening up a new level. The mine is looking finely.

W. PICKERING, of London, arrived in Tucson, A. T. last week. He is in the interest of the Canada Del Oro Mining Co. He is highly pleased with the outlook of the Canada Del Oro properties in Pima county. He states there is plenty of ore at the smelter, and the different mining claims show large bodies of good ore. Mr. Pickering proposes to become a permanent resident of Tucson.

Ancient Placers in the Land of the Incas.

Rehabilitating the Gold Fields of Ecuador.

SAN FRANCISCO, Oct. 8, 1892.

TO THE EDITOR:—Heretofore our California mining prospectors have shown themselves the pioneer explorers of the mineral regions situated on the Pacific slope of the continent. Until recently they had been the first to enter and open up all mining territory lying west of the Rocky mountains, and also of the great Andean Cordillera of South America; but, if reports may be credited, the New Yorkers have at last stolen a march on us, having some two years since secured in a quiet way title to an extensive tract of rich placer ground located in the Republic of Ecuador, South America; what makes this event the more noteworthy being the fact that this country has never been considered especially rich in the precious metals.

To Peru, its neighbor on the south, tradition has assigned a great wealth of both gold and silver, this having been the land of the Incas, whose immense store of these metals led to the speedy conquest of the country by the Spaniards, who, immediately they had obtained a foothold, proceeded to despoil these native princes of their treasures. So enormous was the plunder thus obtained by the cruel and ferocious Pizzaro and his followers that they sufficed to load many galleons sent home to Old Spain.

It does not appear that these freebooters secured any great amount of plunder in the country now known as Ecuador, and for the reason probably that the larger cities and the bulk of the population then, as now, were located in the distant interior, occupying the great valleys lying between the two principal ranges of the Andes. In one of these valleys, far from the coast and difficult of access, is situated Quito, the chief city and capital of the republic. That the ancient inhabitants of this region were not behind their neighbors in architectural or other kind of artistic skill is evidenced by the well-preserved remains of their palaces, fortresses, causeways, bridges, etc., some of which are very extensive, all being built of solid material and well constructed. That their religion was closely allied to that of the Peruvians, if not the same, is denoted by their temples and sepulchral mounds, these peoples, like the Mexicans, being sun-worshipers.

INCEPTION OF THE ENTERPRISE.

The history of this new movement, as we obtain it from Russell F. Lord, C. E. E. M, is as follows: About two years ago, Otis S. Gage, of New York, while on a business visit to the city of Guayaquil, in the Republic of Ecuador, met there a banker named Jose Maria Borja, who gave him information about three Spanish grants located in the Province of Esmeraldas, and which were represented to contain extensive placer deposits. The title to these properties rested in the banker, he having inherited them from his ancestors, to whom they had many years ago been granted by the King of Spain. These placers are worked by the negroes who inhabit the country, but in such an inefficient way that they afford the owner no revenue. As a consequence, he was anxious to have them pass into the hands of parties who could make their wealth available to all concerned.

Senor Borja had procured these mines to be examined and reported upon by Clarence E. Dougherty, a mining expert who had resided in Ecuador for 20 years, having at one time been in the service of the Government as State Engineer. Encouraged by the statements made in this report, Mr. Gage took an option on the entire property, which, on his return to New York, he passed over to a syndicate of capitalists, who sent F. S. Ketchum, an experienced mining expert and engineer, to further examine and report upon it.

A little later, Mr. Lord was by these same parties dispatched on a similar errand, he being further charged with the duty of selecting a suitable point at which to commence operations, make estimates for plant, etc., if in his opinion the proposed investment promised to be a good one. That the syndicate should have reposed such confidence in the judgment of this gentleman is explained by the fact that he had held many responsible positions in the line of his profession, having formerly been superintendent of the Delaware and Hudson canal, aod at a later period manager of several large and successful mining enterprises in Central America. He is a brother of Major Lord of the U. S. Army, now stationed at the Presidio, and comes of an ancient New York family, several members of which have been distinguished in both military and civic life.

RIVER SYSTEM—NAVIGABLE STREAMS, FORESTS, CLIMATE, ETC.

As before stated, the properties in question consist of three Spanish grants, named respectively the Cachavi, the Uimbi and the Playa de Oro, each comprising about 35,000 acres. They are situated in the Province of Esmeraldas (the emeralds) which occupies the extreme northwestern aogle of the republic, being nearly under the equator and close to the Colombian line. They are separated from each other by large and swift-flowing rivers, coursing generally toward the southwest and west, these rivers being named the Santiago, Bogota, Cachavi, Rio Cito and the Cayapas. The country between these rivers consists of low, rolling hills, cut by many *quebradas*, or ravines, through which flow streams of greater or less magnitude, all tributaries of the rivers mentioned. The Santiago river, of which all the others are confluents, is navigable for large vessels 18 miles up to Barbon, and for light-draft craft thence on 16 miles, nearly to the town of Conception, located near the junction of the Bogota and the Cachavi rivers, northern branches of the Santiago. From Conception freight can be taken in canoes up as far as the Cachavi mines. Vessels drawing six feet of water can go from San Francisco to Gage City, located on the river Santiago at a point six miles below Conception; thence to the Uimbi and the Playa de Oro mines a cartroad will be built, making but one transfer necessary between this city and these mines. On the bar at the entrance to the Santiago river

there is 15 feet of water at low tide, with a depth of 30 feet, and a safe harbor inside. At the mouth of this river stands the town of Simones or Posa, now the principal port, a distinction formerly enjoyed by Bolivar, situated on an outletting arm of the Santiago, a short distance to the north.

The country, with the exception of a few small clearings, is covered with trees of large size, with the dense undergrowth common in most tropical regions. From some of these trees, a species of cedar, a fairly good lumber can be made.

While the coast, both to the north and the south of this point, is hot and unhealthy, the climate in this particular district would appear to be both salubrious and comfortable, there being but little sickness among either the native or foreign population. The temperature keeps within the range of 72° to 82° the year round; these more favorable meteorological conditions being due to the influence of the cool ocean current from the north that here strikes the coast, to the many swift-flowing rivers that traverse this region and to the proximity of the Andes, several of the higher peaks of which stand close by on the east, their upper half never free from snow. While there are several months that are considered dry, showers occur here almost every day in the year.

THE GOLD BEARING DEPOSITS

Which cover nearly the entire area included within these grants, are composed of a body of gravel ranging from 20 to 100 feet in depth, the average being about 60 feet. This gravel, with the exception of a four-foot stratum of soil on top, is auriferous throughout, the presence in it of a small percentage of clay having prevented the bulk of the gold sinking to the bedrock, a soft formation, apparently of marine origin. The elevation of this bedrock above the outletting streams varies from 20 to 100 feet, insuring everywhere ample dump for tailings. The altitude of these several tracts varies from 50 to 800 feet above sea-level. As the gravel here contains no pipe-clay, hard cement or large boulders, it can be broken down and washed with a moderate head of water, no bedrock tunnels, derricks or powder-blasting will here be required. This gravel will, it is claimed, yield, under hydraulic-washing, an average of 40 cents per cubic yard.

When fully equipped and in operation it is believed that the total output of gold on each of these grants will exceed $8,000,000 per annum—$25,000,000 for the series of properties. That the net profit realized on this production will be large it is needless to say, that is, assuming that the data on which these several mining engineers and experts have based their calculations to be correct.

WATER SUPPLY—QUANTITY AND VALUE OF GRAVEL.

Any quantity of water can, by means of short ditches, be brought upon the mines, and there delivered under all the pressure needed. The supplying streams, having their sources in the foothills and outlying spurs of the Andes, are numerous and never-failiog, the rainfall in that region being superabundant. Owing to the loose and porous nature of the soil, much iron pipe and fluming will be required for bringing in the water.

For prospecting the gravel the facilities existing here were found to be extremely good, the many ravines and the open cuts made by the natives for washing out the gold affording ample opportunities for determining both the grade and the amount of the auriferous material, which latter, careful examinations, conducted at many points, showed to be very extensive. While the average value of the gravel was fixed at the figure mentioned, the experts are of the apinion that it will go much higher. The quantity of the gold-bearing gravel standing upon each one of these several grants was estimated at 700,000,000 cubic yards—2,100,000,000 for the whole property, giving a total of $840,000,000 in gold! These seem like big figures—in fact, they are big—hut they are not of our framing; we give them as we have received them, together with the authorities on which they are based; the same, as there is reason to believe, being wholly reliable.

PRIMITIVE METHODS OF GOLD WASHING.

Gold-mining in this section of country is not a new thing, the business having been practiced here for hundreds and perhaps thousands of years; first by the aborigines and later by the present inhabitants and their progenitors, and always of course by the crude implements and methods now in use; hence the small impression made on these deposits though worked for so long a time. These workings—mere open cuts of limited extent—sufficiently denote how little exhaustive have been the implements and methods of washing here employed. The present inhabitants of this district are pure negroes, descendants of the slaves formerly held in bondage by the Spaniards. Although they cultivate a few patches of ground, raising corn, melons, plantains, etc., their chief occupation is gold-gathering, a business pursued in the following manner: The miner seeks, not the richest ground, but a spot where rain water can best be collected, or the bank of a small stream into which he can cave down the bank with a crowbar and thus ground-sluice the dirt, a batea for cleaning up being used. If, by this process, his earnings amount to 25 cents per day, the miner is content; nor will he work beyond what his most absolute wants make necessary. Indeed, he has very little time left for work after having observed the numerous holy days imposed upon him by his religion, and which are said to slightly exceed the number of days in the calendar year! But, although thus handicapped by this creed and lacking in thrift, these natives are so faithful and manageable that with a little of the right kind of training they could be converted into good workers: wherefore it is expected that their labor can be made profitably available in operating the mines. All that the new owners of these properties purpose doing, when ready to begin active operations, will he the employment of white overseers, mechanics, etc., the common labor being performed by the natives of the country. For handling the canoe, packing goods, and various other kiods of unskilled labor, these people, both men and women, are very expert.

LAND AND WATER CARRIAGE.

Almost the only means of transportation in this country is by canoes on the more rapid streams and by larger vessels on the navigable rivers, or on the backs of men and animals, these other means of transportation being absent. There are not over 30 miles of railway nor more than 200 miles of wagon road in the entire republic, all other land communication being by mule trails, always bad and in very wet weather wholly impassible. The streams are generally without bridges other than those of the suspension type—a rope carried from bank to bank with a sort of car slung beneath, in which the traveler with his traps is hauled across. Made of agave fiber, these ropes, flimsy concerns at best, are liable to early decay, if they do not sooner part entirely, thereby rendering the passage of these streams, always deep and rapid, exceedingly dangerous.

It is a strange thing that a republic with its capital city so far inland should yet have between it and the seaboard no other means of communication than a mule trail; and yet the Spanish race has been in possession of this country for more than 300 years! Before Virginia City, the site of the Comstock mines, was ten years old, it had been connected with this port by rail, a great mountain range and a distance of more than 300 miles intervening between these two points. But then we have more enterprise, with fewer holy days, than this younger republic under the equator; secular time counts here!

From Engineer Lord, who, on his way to New York, stopped a few days in San Francisco, we learn that most of the plant for the new mines, which are to be outfitted and worked on a vast scale, will be procured in this city, the big iron pipes, giants, etc., having already been contracted for. As most future supplies will also be obtained here, San Francisco may expect to largely benefit by these great enterprises so about to be inaugurated in the land of the Incas! D.

Gold Mines of Sierra County.

From our Traveling Correspondent.

TO THE EDITOR:—In continuing my description of the mines of Sierra county, consideration will next be given to Forest City, where the mining interests have a more substantial appearance than any other part of the county. The place has from the earliest days been a successful camp, though it has of course known its dull times. But as one mine has become exhausted, another has risen to take its place and continue the flow of bullion. The Bald Mountain followed on the course of the Live Yankee, and now comes the Extension and the Ruby to fill the place of their once famous predecessors. The Bald Mountain channel, or Blue lead, as it is sometimes called, is an ancient river gravel deposit that has proven rich wherever developed. Its course has been traced from the southern portion of the county, near Minnesota, through Chipp's Flat and Alleghany, and north as far as the noted Monte Cristo diggings. Under Bald Mountain the channel seems to have branched; one branch running to the east and the other continuing northward. The character of the gravel in these branches is distinct, showing they were separate channels and from different points of origin. The north branch, as well as the main channel, is generally of a quartz formation. The east is distinguished by the granitic and porphyritic character of its gravel and boulders. Both have proven rich, though the east has been less developed, as it soon loses itself under a lava capping, and tracing it from the surface becomes impossible.

BALD MOUNTAIN EXTENSION.—This lies in the east channel and, as its name signifies, adjoins the old Bald Mountain mine. Captain Wm. Meikle is superintendent. The working tunnel is entirely in bedrock, a mile in length, and 25 feet below the pay channel. Consequently work goes on through upraises. Two drifts have been run north and south a distance of 900 and 700 feet respectively. Breasting is going on in the former, but not in the latter, as it is necessary to work this by incline.

The present indications are that the channel is widening and improving its even now splendid prospects. At times, lava spurs have run into the channel, directly across the course of the chute, that has threatened to pinch them out completely, but continued operations have invariably overcome the obstacle and carried them on to even richer portions. About 40 men are at work.

THE RUBY GOLD GRAVEL MINING CO.—This company's property lies in the north channel and, like the preceding mine, is an extension of the old Bald Mountain. Mr. E. McCormick is superintendent. The mine is developed by a bedrock tunnel 2200 feet in lengh, run in a southeasterly direction, and by about 8000 feet of drifts and gangways. They are now working northward toward Rock creek and also toward their southern bounds. The gravel here lies particularly in benches and work is done from three levels varrying as much as 100 feet in different channels. Thirty-five men are employed. The mine is said to be in splendid financial condition. A few months ago a nugget weighing 206 ozs. was found, valued at $3700.

WISCONSIN EXTENSION.—This is still in the nature of a prospect, but as it lies in the same general line as the foregoing, adjoining the Ruby on the north, it is well worthy of mention. Its channel, though well defined and rich, is supposed, however, to be distinct from the Bald Mountain. It is operated, under the superintendence of Mr. Henry Grant, in the interests of several Marysville capitalists. Work has been going on, the present season, on a small scale, through a 500-foot tunnel. The next spring, an old 2000-foot tunnel will be opened up and work begun in earnest—so 'tis said.

THE MAMMOTH SPRING CHANNEL.—In the Forest City district, east of and nearly parallel with the Bald Mountain channel, is another ancient gravel deposit known as the Mammoth Spring channel. It is, however, far less developed than the former, owing to the depth at which the gravel lies and the difficulty of tracing its course. Two companies are now vigorously exploring it. The first is the Mammoth Spring mine of F. A. Davis and E. B. Rambo of San Francisco and E. Spaulding, superintendent, of Forest City. A bedrock tunnel 2000 feet in length has been driven, and a few feet more was expected to bring them upon the gravel channel.

THE MAPLE GROVE MINING CO., under the superintendence of Dr. C. P. Saxton, is operating the west extension of the Mammoth Spring, and with a 325-foot tunnel also expect soon to be in rich ground.

ALLEGHANY.—Two miles south of Forest City is the Alleghany mining district. The interests here are entirely quartz, and the mines are, as far as quartz properties are concerned, the most promising of any in the county.

Messrs. Grant and Apple were the first to start a boom in this direction by developments in their Mariposa mine, half a mile south of Alleghany. Till two years ago, this was only an abandoned tunnel, run 25 years since. They bought it, ran ten feet farther, struck the ledge, and took out $75,000 in about a week. They have continued work and are now at the bottom of the creek, where it has become necessary to put in machinery to handle the ore and water. This will be done the next spring, and at the same time a ten-stamp mill will probably be erected.

Others quick to realize the quartz value of the district and develop promising properties are L. E. Newton of the Golden King, Chas. Hellman of the Rising Sun, and Fessler of the El Dorado. These claims are all on Kanaka creek, and about two miles east of Alleghany.

GOLDEN KING.—Mr. Newton has arranged for the immediate erection of a ten-stamp mill. The ledge, averaging two feet in thickness, and from $30 to $40 per ton in free gold and sulphurets, is exposed by three tunnels, the longest being in 160 feet, and from that a shaft sunk. A new tunnel is now running, and is in over 100 feet. The ore is being stored on a dump preparatory to crushing.

RISING SUN CONSOLIDATED.—Chas. Hellman of Oakland is the principal owner and superintendent. This also has all the promise of a big mine. The ledge averages four feet, the ore mostly free milling and high grade. Mill machinery will not be erected until next season, and the work now is entirely that of development. Four tunnels are in, the lowest being 200 feet, giving 300 feet of backs. An air shaft is being sunk to meet this tunnel.

THE EL DORADO, or, as it is more generally known, the Fessler mine, has also proven very rich as far as developed. San Francisco parties now have a bond on it, and they will in all likelihood buy it and erect proper milling works, etc. The mine is opened by three tunnels, the longest being 340 feet.

The ledges of these mines, and of the entire district, have a prevailing direction of southeast and northwest, and are presumably in the same mineral zone as the Eureka district of Nevada county, though the formations of the two counties are quite different. In Nevada they are almost entirely in granite, occasionally being on the contact of the slate. In Sierra, a haoging wall of serpentine and a footwall of slate and sometimes porphyry is the general rule. The middle Yuba traces the line of change.

Another promising quartz property in this district is the the Warwick mine, in French ravine, under the superintendence of Capt. W. H. P. Smith. This ledge is in serpentine and porphryry, and, as far as prospected, has given favorable evidences of a good continuous milling ledge.

At Pike City, the Alaska mine and its 40-stamp mill still stand idle on account of litigation. Parties owning it are anxious to work it, and others stand ready to buy if there is a chance of securing it. The mine was last worked at the 500-foot level, but has been allowed to fill with water during the past four years. There is talk of operations being resumed soon.

THE PILGRIM.—This is another splendid mill lying idle. It is at American Hill, seven miles east of Forest City, and is owned by San Francisco and Eastern capitalists, who spent immense sums of money in erecting a 30-stamp steam mill, and in developments, and then found there was lots of quartz, but not enough gold to pay for running the mill.

In the Downieville district, there are a few mines that are not worked out, but either lying idle pending a sale or working desultorily.

THE GOLD BLUFF MINE, of A. Van Slyke, two miles north of Downieville, is expected soon to he transferred to New York capitalists, in which case it will be reopened and large and new mill works erected. A 12-stamp mill is now on the property, but has not worked for two years. The mine is opened by three levels from the surface, the longest being 2300 feet.

OXFORD MINE, known as the Good Hope, lies back and northwest of the former, and on a parallel ledge between serpentine and slate walls. An aggregate of 1800 feet of tunnel has been run. Its operations will depend on what is done in the Gold Bluff. Mr. H. H. Purdy is the principal owner.

WIDEAWAKE MINE.—This is a gravel mine nine miles north of Downieville, on the Middle Fork of the North Yuba. W. B. Bosch is superintendent. The channel is reached by a 1300-foot tunnel. This is one of the very best mines in the district, the gravel having paid as high as $170 a car; yet it is not being worked with particular vigor.

ASBESTOS.—Four miles west of Downieville on Goodyear's Creek, B. F. Derickson of Forest city, has a splendid asbestos ledge. The ledge is two feet in thickness and has been traced a distance of 3000 feet. It has been partially exposed by a tunnel and a shaft, and at present San Francisco parties are negotiating for its purchase. The lode matter is of very fine quality, suitable for all commercial purposes. Timber and water are plentiful and available for a large manufacturing plant.

SIERRA CITY, once the center of the great quartz operations of the county, is wofully quiet. The closing down of the Sierra Buttes mine, and the suspension of several of the other prominnent mines, have left things here very much at a standstill for three or four years. Appearances seem to point now, however, to an early resumption of operations in many of these old mines, and to the opening of new ones.

THE SIERRA BUTTES.—Work was practically suspended here three years ago. The great lower or No. 9 tunnel,

two miles long, was abandoned, and is now caved the entire length. The 60-stamp steel mill is gradually being dismantled. Twenty stamps are engaged doing custom work; 10 have been removed to the hill or upper works of the mine; 10 have lately been sent to the Uncle Sam mine, Shasta county, owned by the same company; 10 stamps have been sold to the Mountaineer mine, and the other 10 have been dismantled for the parts. A few men have still been engaged working in tunnels 2 and 3, and washing the surface dirt and croppings. How long this work may continue is not known, as all operations may be suspended at any time.

THE PHOENIX.—This is the east extension of the Sierra Buttes. It is one of the few active mines hereabout, and even in the financial embarrasment of its former owners, necessitating a change of management in the past few months, its 10 stamp mill has continued busy. In the mine, a crosscut is run on the vein 700 feet, giving 500 feet of backs; the east and west drifts are 250 feet each, stoping going on in the latter. A wire ropeway, the invention of two Italians of Sierra city, is used to convey ore from the mine to the mill. This is one of the most interesting features of mining machinery to be met with anywhere. There is a single span of 2200 feet running from a point 1000 feet or more vertical height above the mill. Gravity furnishes the motive power. Two cables, one stationary, support the weight, and the other moves the buckets. The distance is traversed in about a minute and a half. To one who has never traveled by telegraph, to sail thus through the air 150 feet above the earth and suspended by a thread, comes nearest to the realization of that form of rapid transit. It is intended at some future time to run a tunnel from the mill, 1600 feet into the ledge, and thus secure nearly 1000 feet more of backs.

THE BIGELOW.—In the same group of mines is the Bigelow, a quarter of a mile above town. Mr. Geo. L. Morrison is working it at present under a nine months lease, and crushing the rock at the Sierra Buttes mill. This is another of those abandoned mines that only a blast of powder more was necessary to open up a rich chute of ore. The workings are open from the surface, the ledge being bent and quite flat, but dipping more steeply as it is followed in. This is the surprise mine of the camp. Mr. Morrison and his brother, both young men, took hold of it as a prospect, and in the first month's (July) run cleaned up $7000 on a 350 ton run.

BUTTE SADDLE QUARTZ MINE.—This is a quarter of a mile east and north of the Sierra Buttes ledge, and 1000 feet higher than the upper works of that mine, and at an elevation of nearly 8000 feet, the highest mine in this portion of the State. F. J. Seitz is superintendent. No permanent developments further than the two tunnels on the ledge have been made. The longer tunnel is in 1000 feet; 400 feet in a rich chute of rock was struck and a shaft of 40 feet sunk, showing a seven foot ledge between good walls. The owners are sanguine that it is a second Sierra Buttes bonanza, but lacking means to develop it fully, are anxious to bond or sell it. It is a good opportunity for the man or company with plenty of capital.

COLOMBO.—Robbin & Son of Trenton, N. J., are the owners; Wm. Penaluna, superintendent. The mine is west of the old Independence bonanza, and about four miles from town. As to its operations, further than the fact that its 10 stamp mill was running steadily on paying rock, I was unable to learn anything definite.

The Keystone group of mines, lying south of Sierra city, includes the Keystone, Marguerite, Mercer, Salinas and Cleveland mines. The last two are the only ones at all active. The ledge features of this group are an east and west strike, dip generally to the north, rock low grade, free milling, and country rock of slate and serpentine.

THE KEYSTONE, the axis of the group, is the property of Senator W. H. Mead. Its 20 stamps have remained idle for some time, and the lower workings of the mine have been allowed to fill with water. The mine comprises some 15,000 feet of vein and has yielded immense sums of money in the past. It has been stoped to a depth of 700 feet. Mr. Mead has arranged for the formation of a large company to reopen the mine. His plan is to run a tunnel from the river level and on the ledge, thus securing 2500 feet of backs in a distance of half a mile. It can he made one of the greatest mining enterprises in northern California.

THE MARGUERITE has remained idle for nearly two years on account of litigation. The mine is nominally owned in Boston, but at present is in the hands of lienholders. This is a very expensive property to work on account of the immense amount of water that must be handled, as the ledge runs east and west with the Yuba river and dips beneath it. Expensive and powerful machinery has been tried, but without success; a Knight's hydraulic engine proving even a failure after a long and costly trial. The mine has been worked through two shafts a depth of 400 feet. Whether practicable means of working this mine may be found or not is a question. There is a fine 20-stamp mill on the property. Five of these stamps are engaged on custom rock from a promising ledge lately opened by Chas. Rogers, four miles above Downieville, on the Sierra City road. Regarding the Cleveland mine, I was able to secure but few particulars. It is owned and superintended by John Castagnetto. It lies southwest of the Keystone, has a 12-stamp will and has been running more or less continuously for some months.

MERCER AND SALINAS.—Mr. J. Hutchison is superintendent of this mine. The property is a mile south of the Cleveland and on a parallel ledge which averages four feet and is here nearly vertical. There are two tunnels on the ledge, the upper in 560 feet and the lower 900 feet. The milling is done from the upper tunnel at present, although it is intended shortly to stope downward. Owing to lack of capital this mine has not shown the developments that its natural advantages warrant. It has a 10-stamp mill.

WILLIAM TELL.—This is a small though promising property a mile and a half southeast of town, and superintended by Caspar Joos. It has six small stamps. There are three tunnels, the working or lower one being in 500 feet, and it is expected soon to be on the ledge. This is on the same belt as the Keystone group. West of this is another small mine of encouraging prospects, owned by J. F. Mora and four associates.

THE YOUNG AMERICA has lain idle for nearly two years. This was one of the bonanzas, but through reckless and extravagant management or mismanagement its career has been varied and shorter lived than it should have been. Mr. A. C. Busch has now a controlling interest and it is his purpose to recommence operations this fall or the coming season. The mine was opened to the 2200-foot level, connecting with a 3000-foot tunnel. Much of the old works have caved and it is the intention now to work from the surface downward.

MOUNTAIN MINE.—This is the north extension of the Young America. It has a 10-stamp mill, an 800-foot tunnel and a well-defined ledge between good walls. The ledge is not yet sufficiently developed to keep the mill busy, but, "another season," Messrs. Winter and Berger, the owners, hope, will see them well under way.

CHIPS MINE.—This is about the one mine of the district that seems to be "standing on its own pins," and the management cares little about making public, facts concerning it. The mine is east and opposite of the Phœnix, on the east side of the Yuba. Mr. Sam Locke is superintendent. Work is prosecuted through a 1000 foot tunnel, and at present stoping is done from above. Next spring, with the introduction of proper hoisting works and pumps, sinking from this tunnel will begin. The rock is medium grade and the ledge averages four feet. Twelve stamps of 850 pounds each, do the crushing. Three power drills are used, two National and one Phœnix; also a Phœnix air-compressor 18x20, double cylinder, run by waterpower under 240 feet of pressure.

At Gold valley there are several mining enterprises of more or less pretension. I was unable to visit the place, but understood that Mr. Giles Gray of Oakland was operating a Tustin mill with considerable success. Lately, he had been putting in the MacArthur-Forrest process. On good authority, I hear it has not proven as satisfactory as its introducers had hoped. CHAS. E. TOWNSEND.

Mining Exhibits in Tuolumne County.

SONORA, Oct. 8, 1892.

TO THE EDITOR:—The fair of the 29th District Agricultural Association was held at Sonora, Tuolumne Co., Cal., on the 28th, 29th and 30th of Sept. and Oct. 1st. The attendance was exceedingly good, both at the pavilion and racetrack; about 1500 to 2000 persons visited both resorts daily. The directors of the Association, Messrs. Chas. R. Parsons, C. S. Fitch, Wm. Sharwood, Joe Majors, Dan Berger, Tom Barney, Jas. Goodwin, Jno. Shine (president), and W. Jones (secretary), are to be congratulated on the success attending everything in connection with the fair. Mr. Hawley, as assistant secretary, contributed largely to the prosperous working out of the details at the pavilion. To give an elaborate statement of all the exhibits would require too much space in your valuable paper, but I will briefly mention the mining, mineral, jewelry and machinery exhibits—the subjects most interesting to your readers.

One of the most prominent industries of Tuolumne Co. is the marble works of Messrs. Bannister & Co., situated on the banks of the Stanislaus river, near Columbia. Their exhibit was located in the center of the pavilion, being both conspicuous and attractive, as it was surrounded by the mineral and mining exhibits—all enclosed by a handsome gilded iron railing. The marble specimens were formed in an obelisk of pyramidal structure, rising some seven feet high, as follows: First, the base was a beautiful polished block of black or dark-mottled calcite; second, a cube rising upward of white and gray marble; third, a blue-gray variegated cube; fourth, a beautiful cube of pure white; fifth, cube of pink, with green streaks running through the block, rare and choice; sixth, and lastly, on top of pyramid, forming apex, a white block of calcite of white ivory cast, cut to a point, each and all clearly finished and polished, which reflected great credit from the perfect workmanship and artistic designs of the company exhibiting. They obtained the first premium. The future of this industry is assured.

Below the back of the marble obelisk, which rested on a raised platform of four sides, with radiating steps covered with black cloth, consisting of four tiers, were displayed the following stalactites, minerals and specimens of blocks of quartz from the undermentioned mines: Golden Gate, quartz rich in sulphurets of great value; Rawhide (mother lode), block of milling rock showing free gold and rich sulphurets with azurite and telluride of gold in profusion; Buchanan, rich rock; Soulsby, rich in free gold, galena and iron pyrites; Santa Maria, very rich pieces of quartz showing large quantities of free gold; Noonday, rich quartz; Eastern, rock worth $150 a ton; Labrador, good rock; Sonorita, valuable pieces; Monitor, rich block; Gerrymander, good, payable quartz; New Albany, many large blocks of splendid looking rock, value $8 to $15 per ton; Kettz, large blocks of fine rock, value $12 per ton; The Algerine, payable rock; Porto Fino, blocks of remarkably handsome quartz and sulphurets of very high grade, free gold value $35 to $42 per ton; Rising Sun, good exhibit of rock showing free gold of value of $10 to $40 per ton; Fair View, late Batten, exhibited block of sulphurets, value $1700 per ton; Alta, $100 rock; Charlotta, exhibited very handsome quartz, free gold $25 to $60 per ton, sulphurets of very high grade; Belcher, good rock; Gem mine, rich rock; App mine, mother lode, valuable quartz; Badger, Private, Joe Hooker and Geo. Mapes, ore rich in silver and gold, and many others of great merit merit too numerous to mention.

The mines above enumerated are mostly working, and all milling propositions, which entitles old Tuolumne to to class among the first rank of gold-producing ores, needing only the capitalist to invest and develop to secure fortunes. This county has been hiding her charms long enough under a bushel. She must take her place more prominently in the near future than in the past. It is certainly not the fault of Nature's laboratory that she has been kept somewhat in the dark. But she needs capital to unlock her treasures: then, under skillful management, she will be a large producer of the precious metals, second to no county in this State.

The present association is doing much in bringing our mines to the notice of the public, which in time will bear fruit. The formation of our county is varied—metallic slates, magnesium slates, metamorphic slates, porphyry, diorites, quartzites, syenites, granites, porphyritic granites, gneissic granites, schist, serpentine (or hydrous silicate of magnesia), limestones, talc or steatites. Samples of most of most of the above could be seen in the mineral collection. The display of gold specimens from some of the pocket mines and milling mines were truly magnificent. A few of the most beautiful must be mentioned:

The Sonora Bonanza, specimens of almost solid gold of great value; the Rawhide mine, specimens very rich in free gold and telluride of gold blended together; the Colby mine (pocket), exceedingly rich; the Fair View, rich specimens; the Sell mine (pocket), very rich specimens free gold intermixed with petzite, worth thousands of dollars per ton; the Sugarman, very rich specimens of free gold surrounded with petzite, very handsome; nuggets of pure gold from Saratoga Hill (pocket) of great value.

Under a special glass globe in the same case was a most beautiful specimen of gold, resembling a butterfly with wings extended, pink quartz forming the body, the wings a perfect tracery of delicate, gold-filiform crystals, feather-like or fern-like in structure. This is owned by Mr. James Goodwin of Mountain Pass, Jamestown. Large amounts of coin for this beautiful specimen have been frequently offered, but the owner refuses to sell at any price.

The particular specimen that took the first premium was intrinsically of greater value than the butterfly. It was recently discovered in a mine (pocket) on Bald mountain, owned by Messrs. Burney, Munroe and Wainwright. The quartz is of a pure white, hard and dense texture. The gold crops out in long crystal spikes, permeating the structure, rising two inches in column form above the plane of the matrix. The contrast of the pure white and yellow metal in such ahundance was rare indeed. The value in gold is several hundred dollars.

In the department of special cahinets there were exhibits by the following gentlemen: Messrs. David Oliver (Bonanza), C. S. Fitch, M. B. Harriman, F. Conrad and John H. Freak. Space, however, will not permit us to particularize their contents. We noticed a very handsome piece of ruhellite—a variety of tourmaline—being red or rose-colored. Mr. Cahezat exhibited a very fine collection of placer gold, some pieces weighing four ounces. We noticed also silver wire, natural product; ribbons of gold in all sorts of fantastic shapes of the precious metal—a study of themselves; how they could he so grotesquely shaped in nature without the aid of man is a puzzle. The same exhibit contained the following minerals: Chrome iron, cinnahar ores and cinnahar crystals, corundium (from Shaw Flat), chalcedony (polished and rough), copper glance, copper sulphates, chalcopyrite, hornite (or purple copper), native pure copper, chrome yellow, manganese (silicate), 65 per cent, opalized wood, silicified wood, pure tellurium, telluride of gold and silver, petzite, sylvanite (from Sugarman mine), tin hullion (Temescal). The whole of this department was in charge of the curator, Mr. J. H. Neale, as also the collection of jewelry made in Sonora and manufactured hy Mr. Neale, he being a practical goldsmith and jeweler. His mounting of diamonds and precious stones were greatly admired, and meritoriously received first premium. This display was a very pretty feature in this exhibit, showing the rough gold and the manufactured. The following is a short list of the principal gems and pieces shown: Large crescent of diamonds with ruby star in center; single-stone diamond rings; bar diamond pins; daisy-center diamond earrings; solitaire diamond earrings; rings of rubies, sapphires and emeralds. There were also miscellaneous specimens of jewelry, precious stones and mounted quartz—all manufactured in Sonora by Mr. Neale and aggregating in value about $2000.

We noticed also an interesting exhibition of giant quartz crystals, found in the Golden Gate mine in large groups of considerable purity. Each crystal was surrounded by a calcareous deposit of later origin, containing axite crystals, formation found in magnesium diorite crossings in the States.

Among the machines from the Sonora Foundry was an iron mining car—very substantial, and which was awarded the first premium. There was also a very ingenious safety gear, thoroughly applicable to any cage or skip, etc., for underground use in mines by way of shafts, by which a rope-breaking, in ascending or descending, the cage or skip, will remain at the point of breakage, so that no accident can happen to occupants. This was given a first premium.

We examined a very perfect working model of a five-stamp mill, with everything in running order, including ore-feeders, aprons, belting, etc., the whole driven hy a model vertical steam engine made by Millard Sweaver of Tuttletown, a 16-year-old boy. This obtained first premium. There were also various designs in scrollwork by the same boy.

There was exhibited a large working model of a locomotive in steel and brass, perfect in all parts, with cab and tender complete in every particular. It was made by Geo. Topping of the Sonora Electric Co., and received first premium.

The pavilion was lighted with electric lights by the Sonora Electric Light Co. The light was perfect, and gave universal satisfaction and pleasure to the concourse of visitors during the evenings, enhancing the beauty of the exhibits, and being so absolutely free from the usual attending heat of gas or coal-oil lamps, was a great luxury to all present, to the ladies especially. Music was furnished by the Snelling brass band of 18 pieces, with intervals of choice music on piano, violin, cornet and fife by our local talent, which was much appreciated. ARGUS.

Mechanical Progress.

Goldfoil-Making.

Up in the Bowery, in that wonderful old street, where beer and hymn books are sold in adjoining stores, there is a small shop where the ancient and curious business of gold-beating is carried on. A *Times* reporter, stepping in there the other day, found three men hammering with iron sledges queer-looking packages. The packages were bound in sheepskin, and were about the size of the fantastically done-up bundles of shooting crackers that retail for a dime. The men brought their heavy hammers down with the regularity of clockwork, turning over the packages frequently, and exhibiting the greatest care to leave no spot on them unhammered.

One of the workmen undid his package and took off the sheepskin covering, revealing what appeared to be many hundred square pieces of tissue paper, laid one above another, like the unhound pages of a book. He ran his thumh rapidly over the edges of the filaments. Between them was the bright glimmer of beaten gold.

"The manufacture of goldleaf," said the workman, "is a very tedious process."

He led the way to a hollow iron pan in which was a bundle of thin-strip gold, dingy like brass, several yards in length, and an inch in width.

"This," he said, "is the gold after we have melted it in the crucible. We put into the crucible an ingot of the precious metal, weighing 2½ ounces and worth $50. This is drawn from the crucible and run through a series of steel rollers under heavy pressure, aod comes out a long strip. This strip is cut up into 180 square pieces. Then that girl sitting over there picks up the square pieces of cutch paper, which is merely oiled paper.

"After she has put a certain number of square pieces of gold between the cutch papers, she does them up in a compact bundle, made firm at the sides by strips of wood, and covered with parchment envelopes, slipping the one over the other. The package then passes to the first beater. He lays it on the heavy stone anvil, which rests on solid ground, and hammers it vigorously for 20 minutes. This completes the first heating. The package next goes into the hands of a girl, who opens it, separates the leaves of oiled paper, and removes the sheets of gold now made quite thin.

"She cuts each piece into four pieces, and places each of the quarter squares between leaves of a very peculiar skin, oily in appearance, and more delicate than the finest tissue paper. Having in this way made other packages of the gold, they are given to the workmen, who hammer them for two hours on the stone anvils. The packages are returned to the girls, who open them and cut each piece of gold into four pieces, put them in other and similar packages of skin leaves, and give them once more to the workmen, who hammer them, this time for four hours.

"In this, the final package, are 900 sheets of beaten gold, each sheet so thin that 48,000 of them would not make a pile over an inch in height. From the hammerer the packages of goldfoil go to the girls, who take out the skins and do up the goldfoil for sale between tissue paper. There are 500 leaves of goldfoil in each bundle, and the bundle sells at $7 to $7.50. The original ingot of gold is worth $400 when turned into foil.

"The thin leaves of skin used in the beating process are made from the stomach of an ox, and only four of the little leaves can be obtained from one animal. The leaves are worth five cents each at wholesale, so that the 900 skins in each package are worth $45, or far more than the gold between them. A careless workman may destroy a skin after several heatings. The best skins, in the hands of careful and skillful hammerers, will stand 200 beatings.

"The little cups in which the gold is melted are made of sand. The parchment in which the packages are hound is mostly brought from London, and is hought up by peddlers from lawyers' offices. The hest goldheaters, as a rule, come from Germany and England. The parchment costs $1.50 per pound, and can be beaten for 30 hours." New York Times.

A Movable Coke Oven.

The Connellsville *Courier* recently printed a description of a new design of coke oven lately invented by Hugh Kennedy, manager of the blast furnaces of the Isabella Furnace Company, at Sharpsburg, Pa. It is as follows:

An entirely unique and simple design of a rapid, self-discharging coke oven has been invented hy Hugh Kennedy, of Sharpsburg, Pa. It is in actual operation at the Isabella Coke Works, at Coketon, Pa. The oven proper consists of a cylindrical frame of plate steel 6 feet high by 12 feet 6 inches diameter, strengthened and stiffened by a 6 hy 6 inch angle and made sufficiently strong to resist all expansion of the brickwork under the action of the heat of the coking coal.

To the cylindrical shell are securely riveted heavy-wrought steel hrackets inclosing four steel axles bearing directly on car wheels. These brackets and wheels are braced and stiffened properly so as to avoid any sagging or twisting motion that may be induced by moving the oven. The oven is then placed on rails and lined as a common, ordinary beehive oven; hut it has no contact with the foundation, except through the wheels to the rails, the arch resting in 6 by 6 inch angle.

The coal, when coked in an ordinary oven, is first watered and the fire extinguished before it can be drawn. This watering must necessarily cool the oven all over to a certain extent, and consequently when recharged it will take the coal longer to ignite. With the Kennedy oven, when the charge is properly coked, the small traveling car is run back of the oven, the hook of the ram is attached, and the engine, which consists of a small, simple, double-acting, reversing engine, is started, and hy means of a rack and pinion pushes the oven off its bed and carries the coke with it, which drops, piece hy piece, into the pit in front of the foundation, where it can be thoroughly watered and handled. The oven is then drawn back on the main foundation as hot as when started, and recharged with coal, which ignites the moment it touches the bottom.

As a great deal of coke is shipped in covered or boxcars, as well as open tops, it is necessary to arrange to load them as well as the others. This is effected by means of four swinging doors in the bottom of a chute. The doors are placed between the supporting rails and made to swing back out of the way, thus allowing the coke to fall to the loading floor below, which is on a level with the floor of the car, and from which coke can be conveniently loaded. The amount of time saved in drawing, charging and igniting is equal to a large increase in capacity. When the work is properly performed, the whole operation, from drawing to ignition, need not be ten minutes, a wonderful saving. The coke produced at Cokeville in the oven is as good as that produced in the ordinary beehive oven.

A Coming Large Steamship.

It is announced from London that the White Star Company has given an order for an Atlantic steamer which will eclipse all boats now in the service in points of size and speed.

The Belfast firm of Harland & Wolff is to construct the steamer, which is to be ready for sea in the spring of '94.

This vessel, which will be called the "Gigantic," will be 700 feet long, 65 feet 7 inches beam. She will have three screws, will be driven by engines aggregating 45 000 horsepower, and is expected to have a maximum speed of 27 knots with a sustained speed of 22 knots.

This announcement will probably seem somewhat strange to those who remember that the Great Eastern was unprofitable chiefly on account of her size, though she was 20 feet shorter than the proposed new vessel. There are many other essential points, however, in which the two vessels are quite unlike. In the first place, though longer, the new vessel will be over 17 feet narrower beam, and presumably of considerably less draught than the Great Eastern, while she will have ahout four and a half times the enginepower, and about 75 per cent greater speed. It is prohable, also, that she will have no such forest of rigging on deck as was given the Great Eastern, if indeed she have any rigging worth speaking of, which is doubtful, though we are not informed upon this point.

The Great Eastern was of wood, and had a single screw and two paddle-wheels.

These, the main points of difference between the two vessels, well illustrate the direction which the changes made in ship building have taken, and there is no telling where development along the lines indicated will stop, though it is likely to be a long time yet before another vessel is built equaling the enormous tonnage of the Great Eastern, which, at 30 feet draught, had a displacement of 27,000 tons. Such a proportion of width of beam to length, as that possessed by this vessel, is inconsistent with high speed, while such great depth of draught is a serious obstacle in entering harbors and in reaching docks. It seems probable that we shall, within a few years, possess many vessels exceeding the Great Eastern in length, power and speed, but not in tonnage.—American Machinist.

Scientific Progress.

Glass for Thermometry.

With reference to the report of Prof. von Helmholtz as to the progress of German technology, Lord Kelvin observed, at the recent meeting of the British Association, "20,000 thermometers standardized yearly in Berlin, 30,000 in the Thermometric Institute of Wiemar! This is really a matter of life and death; it is a matter of life and death to be able to distinguish between a temperature of 98° and 98½°. Fifty years ago with the very best and most expensive opticians, who combined with optical work the sale of thermometers at 15s. or £1, errors of from 1° F. to 1½° F. were found. Our thermometer-testing at Kew corrected that state of things about 40 years ago. In it the testing of thermometers is practically carried to a very close degree of accuracy; and thermometers so tested can now be purchased at moderate prices from ordinary opticians in this country. I do nnt know whether it is from Germany that our clinical thermometers are now obtained; but medical men have discovered that the practical use of clinical thermometers is of extreme value. We want to he told what is done in Germany in order that we may be led to increase vastly our resources in this direction. It is not a matter of national jealousy; but it may he properly a matter of national emulation. It is a nohle object to prompt the artisan of England to put in as good work, and to have as good scientific direction for his work, as his brethren in Germany. After what we have heard of what the Duke of Weimar is doing for promoting the usefulness of the work of the large number of glass-blowing artisans in his principality, we must feel that it would be well for the Government of this great United Kingdom to do all it possihly can to render the work of the artisans of England, Ireland and Scotland useful to this country.

"It has been said how important the Reichanstalt has been in thermometry in finding out the right kind of glass. Kew has been testing thermometers with a view of ascertaining whether it is possible to get glass here which will do equally well. I have thermometers in my pocket which Joule used in 1840. That glass is as good as any that can be made now. The art of making glass has been lost. The glass now made is not of the same nature as that made in this country 50 years ago. I believe if we could get back to the glass used at that time we should have thermometers equally as good as those. If such work had been carried on at Kew, together with the testing of thermometers to a greater extent, our instrument-makers would he in a position of making thermometers of a very high order. There is this other point clear also from the remarks made; the enormous importance of research work of this kind to the artisan, to the instrument-maker."

The contention is, apparently, that 50 years ago the work of graduation was done less efficiently than now, but that the glass of which the thermometers were made, being, perhaps, of simpler constitution, was less susceptible to influence inducing devious conditions of strain.

Dangers of Dynamite.

Theoretically, nitroglycerin, when exploded, decomposes into oxygen, nitrogen, steam and carbonic acid. Mr. P. F. Charon, in an article in the *Genie Civil*, states that practically a complete explosion is never obtained, and that the gas produced always contains the vapor of nitroglycerin, which is extremely deleterious to the health of those breathing it, producing headache, nausea and even vomiting. Carbon monoxide and nitrous-oxide vapors are also formed, the former being a poison, and the latter acting upon the mucous membranes, producing suffocation and violent coughing. According to the researches of Berthelot, Vielle and Sarran, one kilogram of nitroglycerin will produce, when exploded, 713 litres of gas and steam, calculated at 0° C. at 760 mm. pressure, but as the temperature is raised by the explosion to 6980° C., the volume occupied by the expanded gas at the time of the explosion is 18.900 litres, or nearly 20 cubic meters.

If this explosion takes place in a tunnel or drift of three metres cross-section the gases produced would be driven forward, and displace at least double the volume evolved, that is to say, for a length of 13 metres the air would he partly replaced. Nnw, although this gas is quickly condensed, it undouhtedly does linger sufficiently long to, in many cases, endanger the health of the miners. After citing the experiences of Dr. Darlington on the tunnel of the new Croton aqueduct, Mr. Charon advises that in the treatment of miners poisoned in this manner they be given strong hlack coffee, or, hetter, that they should cautiously inhale ammonia, sulphurous acid or concentrated acetic acid. Prevention is, however, better than cure, and he advises that the ventilation be made more perfect, in order to more quickly carry away the gases formed, and that the noxious gases he reduced in quantity by the use of an increased quantity of detonator.

Chemical Value and Preparation of Magnesia.

Magnesia, formerly chiefly valued on account of its medicinal properties, has recently risen into great commercial importance, owing to its infusibility and its employment as a lining for converters used in the basic process of steel manufacture. Caron, whose process was in the first instance followed, used calcined magnesite. This was made up with one-sixth of its weight of tender-burned magnesia, and from 10 to 15 per cent of water, into a plastic state; it was then compressed into hricks in iron molds and burned at a dull-red heat. Prof. Ehrenworth has pointed out that, if the refractory properties of the magnesia are tn he evoked to the full, it is of the utmost importance that the whnle of the magnesia should be dead-burned; the process, moreover, being carried so far as not only to expel the whole of the carbonic acid, hut also to cause the full amount of shrinkage which the material is capable of attaining. This extreme amount of calcination is very difficult to effect, owing to the tendency of the magnesite to fly into splinters, and to drop to pieces when subsequently touched, and in consequence of its being such a had conductor of heat the stone is very hard to burn in large pieces.

Recently dolomite, which is a douhle carhonate of lime and magnesia, has been used instead of magnesite. In order to prepare this material, there are two processes before the public; that of Closson and that of Scheibler. Under the former plan, the calcined dolomite is mixed with chloride of magnesium, the chlorine in which separates from the magnesia and combines with the lime, yielding a soluble calcic chloride which can readily be washed out, leaving behind the insoluble magnesia. Under the process of Scheibler, the calcined dolomite is treated with dissolved sugar, leading to the formation of sugar of lime, and depositing the magnesia. The solution of sugar of lime is then exposed to carbonic acid gas, which separates the lime as a carbonate, leaving the sugar ready for reuse. Both these systems of producing magnesia have the advantage of relative cheapness in their favor, owing to the low price of dolomite. Prof. Frank, of Charlottenburg, has advocated the use of magnesia as a substitute for plaster of paris for casts, and Grundmann has recently shown the advantage of employing a mixture of magnesia and powdered marble for this purpose. The author states that he has found, following the directions given hy Hirzel, that a mixture of henzole and magnesia is the very hest possible suhstance for the removal of grease from drawings or from any other material.—Annalen fur Gewerbe und Bauwesen.

STEEL AND IRON TUBES.—At the Saratoga convention of Master Mechanics' Association, a committee made the following report on Steel *vs.* Iron Tubes: "The information as to the relative merits of steel and iron for boiler tubes has excited considerable discussion, but your committee has very little definite information at present, We are, however, advised that in the case of a large number of steel tubes the results so far as wear is concerned, have been unfavorable. The following definite experiment, however, has been made: An engine was equipped with 114 iron tubes and 113 steel tubes on December 20, 1890. The iron tubes were placed on one side of the center and the steel tubes on the other side of the center of the boiler, the tubes being divided by a vertical line through the center of the flue sheet. On March 9, 1892, the flues were all removed. Seventeen of the iron tubes were condemned on account of pitting and corrosion, while 64 of the steel tubes were condemned of the same defect. This would indicate that steel tubes are more affected by corrosion than iron ones. Further experiments and information in this line, however, are desirable in order to fully settle this question."

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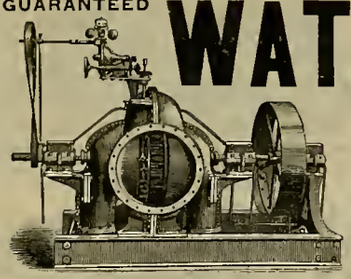

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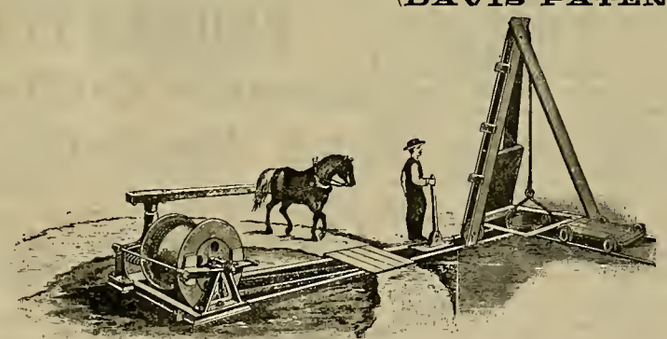

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Electricity.

The Elihu Thomson Prize.

At the last prize contest instituted by the city of Paris for the best electric meter, the prize of 5000 francs was awarded to Prof. Elihu Thomson. With the desire that this sum should serve for the development of the theoretical knowledge of electricity, he has requested M. Ernst Thurnauer, general manager for Europe of the Thomson-Houston International Electric Co., to offer a prize for the hest work on a theoretical work in electricity, and to organize a committee who should propose the subjects, examine the productions and decide the prize. The following gentlemen, we are informed, have been chosen, and have kindly consented to act as members of the committee: J. Carpentier, President of the Societe Internationale des Electriciens; Hippolyte Fontaine; E. Hospitalier, Professor in the School of Physics and Chemistry of the City of Paris; E. Mascart, member of the Institute; A. Potier, member of the Institute, examiner; B. Abdank-Abakanowicz, consulting engineer, Secretary of the Committee.

The committee has decided that the prize should be given for an investigation on one of the following subjects:

1. The heat developed by successive charges and discharges of condensers under different conditions of frequency, nature of dielectric and quantity of charge.

2. It has been shown theoretically that when the two surfaces of a condenser are connected by a conducting body, the condenser becomes the source of alternating currents as soon as the resistance of the conducting body decreases below a certain limit. The formula that permits calculating the period of this oscillation has not yet heen completely verified. This period of oscillation should be investigated experimentally under conditions such that the exact measure of resistance, capacity and coefficients of self-induction may be possihle, in order to arrive at a complete and precise verification of this formula.

3. When a condenser made with an imperfect insulating material has been charged and then left to itself, the charge is gradually dissipated. The time necessary for the charge to be reduced to a given fraction of its initial value depends only on the nature of the insulating material. It is proposed to investigate whether, as certain recent theories would seem to indicate, analogous phenomena do not preseot themselves in metallic conductors, and whether these can be shown experimentally.

4. It is proposed to arrange and systematize our present knowledge of the graphical solutions of electrical prohlems, and deduce from them some general methods as in graphical statics.

The theses presented may be written in any one of the following languages: English, French, German, Italian, Spanish or Latin. They may be in manuscript or printed.

Each thesis presented must be signed by a pseudonym and accompanied by a sealed envelope bearing the same pseudonym on tbe outside, and with the name and address of the author inside.

The papers must be sent before the 15th of September, 1893, to B. Abdank-Abakanowicz, consulting engineer, the Secretary of the committee, at 7 Rue du Louvre, Paris, who will furnish any further information required.

The Microphone as a Diagnostician.

Mr. J. Mount Bleyer, of New York, has been engaged for a number of years experimenting with microphones for the detection of feeble sounds of all kinds, which under any other condition could not be discovered by the unaided human ear. After a number of very costly investigations toward that end, he discovered the ideal microphone for making observation upon the feeblest of sounds, whicb would otherwise go unnoticed. This microphone is heing so arranged that physical diagnosis may be made directly with the microphone itself, in the same manner as with the present stethoscope. If, for instance, such a physical examination one wishes to preserve for reference, or otherwise, the microphone can also be attached directly to the phonograph and a record made of any special sounds of interest in the cost. This has been his ideal idea for years.

Dr. Bleyer has made numerous experiments upon the heart respiratory and the sounds of blood vessels, sounds of animals and human beings under varying conditions of life. In a specially interesting case, where death was not certain, the microphone decided the faint pulsation of the heart, which proved at once that life was not extinct. Many interesting points are connected with his investigations in the use of the phonngraph and microphone in relation to the science. His microphone is of original construction and principle, which accommodates itself to any position placed in on the subject under observation. This was the most difficult point to overcome.

His paper upon the new method of making physical diagnosis and use of the phonograph will appear before the International Congress at Rome, 1893.

We hope for the sake of ourselves that some one has given enough of his time to investigate a mode of discovering whether the circulation of the blood has ceased to make its rounds in the body after the doctor pronounces us no more, and save us these horrors so often related to us about cataleptic states and being buried alive. There is no doubt that such a microphone will be indispensable to the medical scientist.—Electrical Review.

LEAD-ZINC ACCUMULATORS.—The idea of employing a zinc plate as the negative in an accumulator and depositing an alloy of mercury and zinc during charging, dates back several years, and presents certain attractive features on account of the high E. M. F. obtained (2½ volts), and the reduction of weight in the negative plate, which may be further lightened by employing copper, on whicb the alloy of zinc is deposited. But experience has shown that the condition of the deposit is seriously affected hy the specific gravity of the solution at the time of charging, and by the rate of cbarging, which, in order to produce a good deposit, must be very slow. Again, as the result of cbarging is to liberate free acid, it is found that a charged cell left to stand will gradually lose its charge, owing to local action of the acid on the negative plate. In most accumulators it is the positive plate which gives tbe trouble, and this type of cell is subject to the same defect, but it suffers from the additional weakness in connection with the negative plate referred to above, which would require constant attention being paid both to the solution and the condition of the negative plate. One of the hest cells of this kind is that of the River and Rail Company of America, who are pushing a cell, the invention of Prof. Main. It is, however, very unlikely that the above inherent weakness will ever be overcome.—Electricity.

AN ELECTRIC GRAIN-BIN INDICATOR.—An electrical device has recently been designed for the purpose of assisting men employed in elevators to tell when the bin is full. The apparatus comprises an electric battery, a bell and a diaphragm which is placed in tbe bin at a distance of about 18 incbes from tbe top. This diaphragm is connected by wires to the battery and bell and when the bin is full the fact is indicated by the ringing of the bell, which continues till it is cut out by a switch provided for the purpose, the bin being also indicated by the number of the switch which corresponds to it or by a point annunciator. This device can also be applied to telling the amount of grain in the bin, which is now done by lowering a lighted lamp into the bin by a rope. Electric grain-bin indicators have been placed in Armour & Co.'s elevator, Chicago, hy Mr. E. Sberlock, who is interested in the invention with Newton & Co., of Aurora, Neb. This apparatus is worthy of investigation by elevatormen and otbers, as its introduction saves an immense amount of trouble and labor.

IN THE HOUSEHOLD.—The wife of a young electrician, well-known in New York, has just returned home after a protracted sojourn in Buffalo, where natural gas is almost as mucb of a household necessity and convenience as running water. She has many stories to tell about the labor-saving uses to which natural gas, combined with electricity, is put. The one that interested her husband most is her description of an arrangement which she saw in the house of a Buffalo friend, wbereby the master or mistress of the house can, upon awakening on a frosty morning, touch an electric button in the headboard of the bedstead and light the fires in the dressingroom, diningroom and kitchen. Another electric signal arouses the cook, and by the time tbat she reaches the kitchen she finds a hot fire awaiting her. The house meanwhile becomes comfortably warm while the members of the family are dressing.—Electrical Review.

ORDINARILY a travel of 100 feet per minute is considered a fair speed for pistons of pumps. For feeding boilers it should not exceed 50 feet per minute. In fire pumps, where the largest quantity of water is required, the speed exceeds 200 feet per minute.

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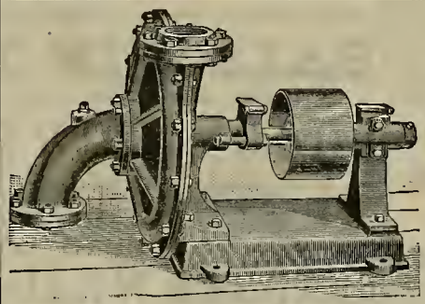

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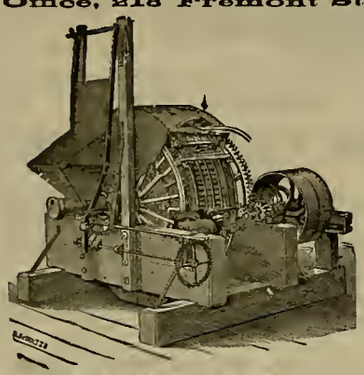
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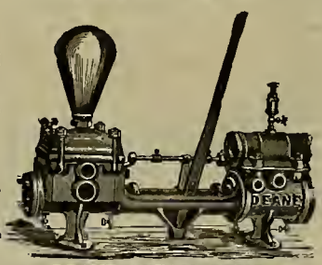

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There is not a life insurance company in the country that would take a risk on the life of a "powder stover." Most people never heard of a powder stover, and if all the powder stovers in the country were to go on a strike to-morrow there would not be much of a rush to get their places, for the business of a stover is about as unhealthy a job as anybody could well imagine. After gunpowder has been manufactured there is always a certain amount of moisture left in it, not so much as to prevent it going off with a bang if a spark should fall on it, but enough to retard its greater efficiency. To make it perfect it must be dried, and the stover looks after that part of the manufacture. The powder is placed in canvas-bottom trays, and placed on racks in the stoving-room until the shelves are all full, and the stover looks round with pride on three or four hundred pounds of powder which he is to bring to perfection. The stover does not get his name from keeping up a fire in the room; "stoving" gunpowder would go undone if it had to be performed in that way. The room is heated by steam pipes to a temperature of about 125° to 135°, and the stover looks in from time to time to see that everything goes on right, for each batch of powder must be stored from 12 to 20 hours. The possibility that at any moment the powder, the building, and the stover may be instantly converted into a large hole in the ground renders his visits brief, but go he must, in order to make sure everything is right. The necessity of making a living compels some to be "stovers," but there are persons who, if driven to that occupation, would rig up a thermometer inside the drying-room window, and do their observing from the outside with a long-range telescope.—Boston Transcript.

MICA AND ITS USES.—There is a greater range of use for ground mica than for the mineral in sheets, and, though the value of that part of the product made use of in this form is small, the many peculiar properties which ground mica possesses render it quite probable that its use will be widely extended. The difficulties to be overcome in grinding mica are considerable, and there are only two or three firms engaged in the business at present. Eight standard grades of ground mica are made. The coarsest of these are used to give frosted and spangled effects to the fancy grades of wall paper. The medium grades are employed in the manufacture of a lubricant for the journals of railway carriages, for heavy bearings generally, and for the axles of road vehicles. The finest grades are used in producing a uniform metallic white surface on wall paper. Scrap mica for grinding must be white and as free from specks or colored matter as possible, since any impurities in the scrap will affect the color and luster of the product. There is considerable consumption of mica on the part of the manufacturers of electrical machinery and likewise for stove purposes. The higher grade micas are used for the latter purpose. The lower grade micas are used by the electrical manufacturers.—Electricity.

HOW LIGHTNING SHOWS ITS INJURIES BEFORE A SUBJECT SO STRUCK.—It has lately been put upon record that, while a company of soldiers was being drilled in an open plain, near Berlin, it had been struck by lightning, and that a large number of soldiers had been more or less injured. Dr. Nicolai has lately published in the German *Military Medical Gazette* the outcome of his prolonged investigation of the case. He agreed with the conclusions of many other authorities, inasmuch as he holds that the injuries received on this occasion show that, apart from mechanical and calorific effects, life is most endangered by injury to the circulatory system. The peculiar arborescent figures so generally present on the skin of unfortunate individuals struck by lightning are, according to Dr. Nicolai, mainly due to obstructions in and consequent tumefactions of the blood vessels. Another fact brought into prominence on this occasion is the marked directional influence of metallic projections, such as are frequently met with on the accoutrements and clothing of soldiers.

COPPER VS. STEEL SHIPS.—Superintendent Cooper, of the Calumet and Hecla Smelting Company, says that he has given considerable thought to the matter of using copper in building ocean-going vessels; that plates of the thickness required would sell for 10 cents per pound after it had done years of service; that the avoidance of barnacles adhering to ships' bottoms by the use of copper was a great saving in fuel, for steamers cou'd then keep up the initial speed guaranteed by the marine architect, and the time saved by vessels not having to go into the dry docks to be scraped and repainted should also be credited to the cost of using copper. The deoxidized Lake Superior copper is only slightly acted upon by salt water, and for tensile strength and elongation it is fully equal if not superior to steel.

IS PETROLEUM INEXHAUSTIBLE?—In view of the oft-threatened exhaustion of coal deposits, it is reassuring to have the opinion of Dr. Mendeleieff, the Russian chemist, that petroleum is probably inexhaustible. This hydrocarbon, although not belonging to any particular geological stratum, is generally met with in regions lying along mountain chains, being found in Europe in the tertiary rocks and in America in the devonian and even in the silurian. The above-named authority attributes the formation of petroleum to the constantly renewed action of water on the metallic deposits of the hot central portion of the earth. The rapidity of its formation, which generally keeps pace with its extraction, is borne out by observation that the level of mineral oil is tolerably constant in wells and boreholes.—American Manufacturer.

SOME interesting experiments were lately made by the telegraph corps of an English regiment in the course of some night manœuvres. A cable was rapidly laid for a long distance over rough ground, and the officer in command of the manœuvres was enabled by this means to communicate with and direct the movements of his most advanced lines as readily as if they were within the sound of his voice. An attempt was made to produce on a map at headquarters a plan of battle during its progress by means of reports wired from the field, but this appears to have failed from some defects in the maps, although the feasibility of the scheme was demonstrated.

THE PLATINUM MINES OF RUSSIA.—The platinum beds of the Ural mountains, according to the *Journal de la Chambre de Commerce de Constantinople*, are the only ones in the world in which this metal is found in grains. Platinum is found in Brazil and in the Cordilleras in the hard serpentine rocks, but never in the form of grains. The platinum beds of the Ural mountains are found in various districts. The platinum found in these places is in the form of grains, in sand frequently containing gold. The weight of these grains is from 17 to 21 grammes to every 1640 kilogrammes of sand. The richness of the beds varies in the same proportions.

BRIQUETTES FROM CHARCOAL.—At Fagersta, in Sweden, briquettes are now being manufactured out of wood charcoal by the addition of coal tar. A paste is made out of the charcoal and the tar, which is transferred to a press whence it issues in slabs about 16 inches thick, which are exposed to the air on the ground for several weeks, during which period the water in the tar evaporates. This combustible has been successfully employed for steam boilers, its calorific power being said to approach that of the best English coals.

THE extent of the car-building industry may be inferred from the statement that the total number of freight cars in use on the various railroads in the United States is about 1,200,000, and that from 120,000 to 140,000 new cars are required annually to take the place of those that become worn out, the average life of a freight car being from eight to ten years. Besides, there is a constant demand for additional equipment by the railroads on account of the increase in their business.

A PHILADELPHIAN has invented a roller-bearing which seems to be quite practical in its work. It can be used on the axles of carwheels, wagon-wheels, pulleys and hoisting blocks. It is absolutely antifriction, no oil being necessary. The bearing is made of steel and has been put to test on a wagon which traveled over 15,000 miles. The inventor has been trying the bearing on some of the mining cars of the Philadelphia & Reading Coal and Iron Co.

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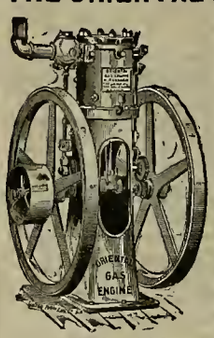

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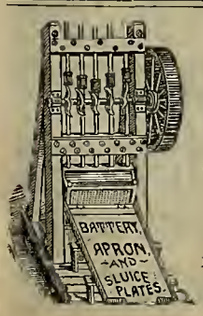

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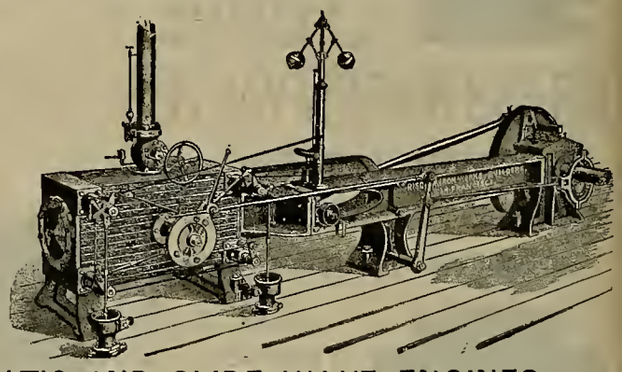

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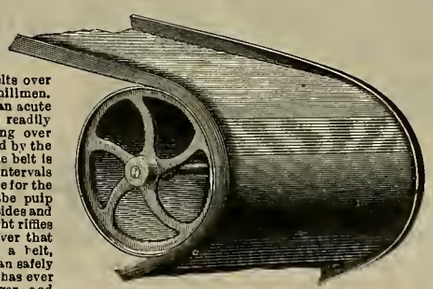

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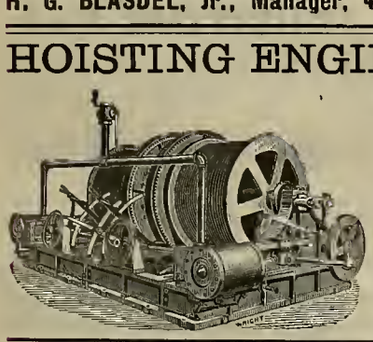

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

CLINTON CON.—Amador *Ledger*, Oct. 8: Some of the employes of the Clinton Consolidated have been put to work again, and we are credably informed that the entire force will be put to work again in about two weeks. The Bay State mine at Plymouth struck a heavy flow of water a few days ago, which drove the men to the surface, and now the engine is working night and day to get the water under control. Messrs. Wise and Seligman of Oakland, who are interested in the Farrell claim near the river, are here with the intention of making some improvements in that property. One of the gentlemen intends to remain here and personally superintend the work. Ground has been graded on the Kennedy mine property preparatory to the erection of a fine two-story house for the superintendent. The Kennedy people are sinking the north shaft 100 feet, with a sump of 60 feet. The Hardenburg mill has been shut down for a few days on account of a break in their water pipe.

Butte.

TWENTY-FIVE TONS A DAY.—Oroville *Register*, Oct. 6: D. K. Perkins came down from Gravel Range on Tuesday, and, speaking of his quartz mine, said he was crushing 25 tons a day, and hoped to put through 600 tons before the rainy season set in to stop work. He is obliged to haul the ore nine miles, so that as soon as rains begin the teams must stop, as the altitude is 6500 feet and the snow falls very deep. If the rock turns out satisfactory, a mill will be erected on the lode next season.

NEW MILL.—It is rumored that a new quartz-mill will be shortly erected in the eastern part of the county. The more the better; if the rich quartz mines of Butte were "whooped up," as they should be, 5000 prospectors would be at work in the Forbestown, Yankee Hill, Bangor and Hurleton districts within the next year.

Humboldt.

WILLOW CREEK.—Cor. Blue Lake *Advocate*, Oct. 8: Outside parties are fast becoming interested in the mining properties of Willow creek and Three creeks. Five more claims are in operation on Willow creek than there were at this time last year. Winter hers are being worked on the following claims: The Kelly, the Cora, the John Haney, the Curran and the Moore (the last mentioned under the superintendence of Capt. Furlong). The Begley claim will begin operations within a few weeks. On Three creeks there are now the Three Creek, the Marion C., the Riverside, the Enterprise, the Ebel, the Lodestar, the Ishber and the Golden Gate claims. The entire length of Three creeks has been taken up. Present information is not exact, but probably at least half of these claims will be worked the coming winter. The Moore claim on Willow creek has been sold to Eureka parties. Vincent White left on the 4th inst. to lay in winter supplies. Freeman Getchell of the Helen claim commences operations next week. C. S. Little will return to his claim to remain all winter. T. E. Knight's sawmill will be in operation inside of 30 days. John T. Talbot and S. M. Alcott of Portland, Oregon, and John T. Moline and Capt. J. M. Murphy, of Vancouver, have been visiting Willow creek and Three creeks. They think well of the mining outlook. Captains Furlong and Curran and W. E. Marshall left to-day on a prospecting trip.

SOME REDCAP COPPER.—Blue Lake *Advocate*, Oct. 8: The mines of Northern Humboldt and of Trinity are not coming into notice for the first time. They were known and to a greater or less extent worked 30 and 35 years ago. Major C. W. Long of Eureka, who, accompanied by Skiff Carson and James Wilson, passed through town Tuesday of last week en route to the Redcap mines returned Wednesday. Years ago Captain H. H. Buhne, Major Long and D. R. Jones took up and secured a patent for a tract of mineral land on Redcep, and 30 or 35 years back they undertook the development of a copper mine there. But the difficulties to be overcome were at that time too great. Improvements were made, a tunnel begun, and about five tons of ore were transported on muleback to Eureka, and thence shipped to San Francisco. The scheme, however, was not a paying one. The price of copper was so very low in San Francisco that it was deemed advisable to seek a market for the metal in Boston. The receipts from the ontput in the Hub city enabled the stockholders to come ont without loss, but there was no dividend. The process of development of the mine was thereafter discontinued, and the buildings erected have been destroyed and much of the timber that stood thereabont 30 years ago has been consumed by forest fires; but interest in the mine has been revived because development of it would not now be attended by so great disadvantages as handicapped the owners in earlier days. Major Long, who on his way to the bay called on the *Advocate*, had a number of specimens of the copper ore, some of which must be 90 per cent copper. He will send them to San Francisco and have them tested, by which test the precise value of the claim may be readily ascertained. If the test shall prove encouraging, it is among the probabilities that development of the mine may be recommenced. The gentlemen who are principal owners posess ample means for working it.

Mono.

BONIA CON.—*Miner*, Oct. 7: During the past week east croescnt No. 1, 550-foot level, was extended eight feet. North drift from Fortuna stope, above the 300-foot level, was extended six feet. Upraise from north drift, 200-foot level, was extended 11 feet.

MONO. — During the past week we have cleaned out and timbered the main south drift, 550-foot level, a distance of 60 feet.

Napa.

SHIPMENTS OF QUICKSILVER.—*Calistogian*, Oct. 5: During September quicksilver was produced at the mines as follows: Napa Consolidated, 510 flasks; Great Western, 366; Mirebel, 167; Sulphur Bank, 120. Total for month, 1136 flasks.

Nevada.

HERMOSA MINE.—Grass Valley *Telegraph*, Oct. 8: They are now hoisting qnartz out of the Hermosa mine, and it is good quartz. The ledge in the drift of the 200-foot level is nearly two feet thick and it prospects well. Gold can be seen in the sulphurets all through the rock, and in a very few days the company fully expects some most favorable developments other than those already in sight.

THE CONLON MINE. — Grass Valley *Tidings*, Oct. 9: Geo. Beebe and J. I. O'Connor, of San Francisco, president and secretary respectively of the Conlon Gold Mining Company, heve been in Grass Velley for the past few days in the interests of the company. They are more then pleased with the property and extensive operations heva been decided upon. The company purchased the property some time ego end reopened an old tunnel which had previously been driven some 250 feet in length to the ledge, and a test crushing of 14 loeds of the ore at Rodgers' mill yielded at the very satisfactory rate of $35 per ton. The size of the ledge is from two to five feet in thickness, and with a mill on the ground the property would prove a very valuable one, even if the ore did not average more than $10 per ton. The mine is situated on Osborne hill, near the well known Centennial mine, and the company owning the miue is a powerful one, comprising a number of capitalists from the East and San Francis o. Active operations will be commenced next week under the supervision of one of the best known citizens, when a large hoisting works will be erected and a quartz mill with the latest improved machinery for the reduction of ore will he placed on the property. The company contemplate running the machinery with electricity, should that power reach this city in the near future. The mine hes been worked for a number of yeers and considerable good qnartz has been extracted, although hnt a superficial depth has been reached. Those best acqusinted with the mine believe that it will prove to he one of Grass Valley's best dividend-paying mines when properly developed.

THE BRUNSWICK MINE. — *Transcript*, Oct. 6: There is a mine in Grass Valley celled the Brunswick. The stock is owned principally in New York. When the New Yorkers invested in it they thought a mine in Gress Valley meant nothing more nor less than a fortune to each of them. No good news came from the mine after they had put their coin into it, and the etock was being peddled out at a few cents a share. They got disgnsted and sent an expert out to investieate. That investigation went on for about ten daye, and the expert went to the telegraph office to notify the New Yorkers that there was nothing in the mine, no quartz ledge or any sign of one; that the ground was more suitable for a cahbege orchard than anything else. It was true that the mine was in the vicinity of the famous Idaho, which hed yielded its millions, but the Brunswick was not in it. The expert decided finally that he would wait a day or two longer before making hie report, and see what the men would bring forth by hard work in developing the mine. The next day to his astonishment a ledge was found, the expert telegraphed the prospect was good for a big mine, and now the New Yorkers are willing and eager to put up coin to prospect the property in a thorough manner.

Shasta.

FROM OLN DIGGINGS.—Redding *Free Press*, Oct. 9: The recent developmeuts in the Texas Consolidated hid fair to place said mine in the foremost of ore-producing properties in Shasta county. The ore-body recently discovered in tunnel 4 is by far the richest yet discovered in that mine. Talk about properties! why, the Texas Consolidated has now been under way for the past three years and, what is more to the credit of the owners of said mine, it has not been idle for a single day. Neither has the ore-body ever petered out. The mine, to-day, is without doubt the best mine in Shasta county. Recent developments in both the Mammoth and Central go to show that Old Diggings will ere long he considered the leading camp, so far as mineral production is concerned, as it will contain more claims from which high-grade ores are being taken than any other. Dame Rumor has it that Colonel Stevenson has made arrangements with the Joshua Hendy Company whereby the interests of both mines, viz., the Reid and the Old Spanish, will be consolidated in future. There is some talk of sinking a joint shaft, 500 feet in depth, for the purpose of developing both. If ore is found continuous for that depth where the shaft is to be located, it will be of vast importance to this community, and it will give an unheard-of impetus to our industry. [With reference to this item, inquiry at the office in the Nevada Block, in this city shows that the Reid Mines Cons. Co. have made an arrangement to work the mines of the Joshua Hendy Machine Works, adjoining their own, and that two deep shafts will be sunk to prove the veins, which are said to be very good on the surface. It appears that the quartz veins of that district have not been proven to a greater depth than 500 feet, and at that depth the Texas mine is working rock which averages $20 per ton, although the ledge is over 12 feet wide. The Reid Company is in good hands, with John L. Howard as president, A. S. Cheminant as secretary, and Robert Stevenson, the mining engineer, as general manager; and, as the company is said to be in possession of some of the best and most extensive mining property in thet well-known Shasta mining district, the "Old Diggings," good success may he expected from that quarter shortly. The company appeers to be carrying on the developments from the sale of treasury stock which is not assessable until $55,000 has been spent on the property, and a limited amount of this stock is being sold at the Pacific bank for $1 per share.—ED. PRESS.]

Sierra.

FOREST CITY.—Cor. *Mt. Messenger*, Oct. 7: The Maple Grove is looming up. Fine gravel is coming out and washing will commence about the last of the week. Experts pronounce in the deep channel, and predict a big mine. Some misunderstanding between the men and owners of the Extension mine caused the former to quit work again, and the town is lively. The boys are good-natured, however.

Siskiyou.

PAYING HANDSOMELY.—Yreka *Journal*, Oct. 12: The Phil Mott claim at Klamath river, below Honolulu, has been paying handsomely this season. In the last clean-up the owners realized over 350 ounces, working 20 men, who opened the cut in about three weeks. This mine has yielded upward of $30,000 for the present season. The McConnell & Quinn claim at mouth of Humbug creek, on Klamath river, has also been paying well, the pay channel being quite extensive and well up toward the surface. The Chinese claims on the river are also paying very well, but not so extravegantly as last yeer. It is difficult, however, to find out what success the Chinamen may have, as they generally say the mines are no good, no matter how rich they yield. G. W. Crowson brought over some rock from his quartz claim on the other side of the Siskiyous in the Cottonwood mining district a few days ago, says the Ashland *Tidings*, and had it assayed by Mr. Allman, the results being highly satisfactory, the rock going $272.53 per ton, $12.05 of the amount being in silver and the remainder in gold. Mr. Crowson had some dispute with parties in regerd to his ownership of the two claims adjoining, but succeeded in making en amicable settlement with H. D. Peersons, who had purchased the interest of the other parties. They split the difference, and he and Mr. P. now have a claim each side by side. The latter has purchased a five-stamp mill and will have it at work within ten days, it is expected. These claims are situated at the head of the old Kit Carson gulch on Black mountain, opposite Jilson's blue gravel claims. The ore is free-milling, and the owners think they have "struck it."

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Chronicle*, Oct. 8: There has been extracted from all parts of the mine during the week 989 1600-2000 ons of ore which was shipped to the Morgan mill, the average value of which, per car samples, was $27.82 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $23.03 per ton per battery samples. Bullion shipped to Carson Mint, assay value, $30,693.25.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, the west crosscut No. 2 has been advanced 18 feet; total length, 133 feet; in porphyry and clay carrying a little quartz of nominal value.

MEXICAN.—On the 1465 level the west crosscnt, which was started from the drift run north from the crosscut run west from the bottom of the winze sunk 101 feet below the sill floor of this level near the south boundary of the mine, has been advenced 17 feet; total length, 133 feet continuing in a soft porphyry and clay formation.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 27 feet; total length west from the joint sbaft, 2482 feet. The face is in porphyry and small streaks of quartz.

UTAH.—The north drift from west crosscnt No. 2 has been extended 18 feet; total length 78 feet. This drift continues in porphyry and clay showing narrow streaks of quartz.

SIERRA NAVADA.—The Cedar Hill drift has a total length of 29 feet; face in porphyry and low-grade quartz We have saved some pay ore from this drift during the week. The intermediate tunnel between the Cedar Hill drift and Kenosha tunnel has been advanced 20 feet; face in porphyry. The joint Sierra Nevada and Union west drift, 900 level, hes been advanced during the week 27 feet, making the total distance west of sheft 2482 feet; face in porphyry and small streaks of quartz.

ANDES.—East crosscut No. 1 north was advanced during the week 5 feet; total length, 169 feet; formation, porphyry and clay. Heve been timbering in this drift during the week.

GOULD & CURRY.—On the Sutro tunnel level, the joint north drift with Sevage Con has been advanced 10 feet through hard porphyry; total length, 576 feet; also did some repeiring during the week.

BAST & BELCHER.—All work has been discontinued in east crosscut No. 3. Started a west crosscnt opposite last crosscut and extended same 18 feet through soft porphyry and etringers of quartz.

HALE & NORCROSS.—We continue retimbering main shaft above the 1000 level. 1800 level—During the week advanced No. 1 west crosscut 25 feet; total length, 50 feet; face in porphyry and qnartz. Weet crosscut No. 2 on thie level was advanced 15 feet; total length, 33 feet; face is in quartz and porphyry. During the week west crosscnt No. 3 was started and has been advanced 18 feet; face in quartz and porphyry.

CHOLLAR.—We are repairing north drift, 750 level. The east crosscut, 160 feet south of north line, 930 level, is ont 119 feet; face in soft porphyry.

POTOSI.—The northwest drift from the 1800 station, Ward shaft, is out 930 feet; face in porphyry. Extracted and sent to mill the past week 429 500-2000 tons of ore from the 550, 930, 1100, 1150 and 1300 levels. Worked during the week 365 tons. On hand at mill 70 900-2000 tons. Averege car-sample assays, $24.75. Average battery assay, $24 08. Shipped to Carson Mint, 701½ pounds of crude bullion.

BULLION.—The north drift, from top of raise, 320 feet south of north line 1300 level, is ont 56 feet; face in porphyry and quartz that yield fair essays. The joint southeast drift from bottom of Potosi winze, 1850 level, is out 116 feet from footwall; face is in porphyry. The northwest drift from 1800 station, Ward shaft, is out 900 feet; face in porphyry.

WARD SHAFT.—The joint Alpha and Exchequer west crosscut, 1800 level, is out 127 feet; face is in porphyry. The joint Potosi and Bullion, northwest drift, 1800 level, is out 930 feet; face is in porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extracted 170 tons of ore and milled 80 tons of the value of $17 20 per ton as per battery samples. The mill was idle three days pending repair. The main north drift on the 750 level hes been advanced 8 feet in low-grade ore. The Zadig drift, Sutro tunnel level, has been extended 25 feet in porphyry.

ALPHA.—The joint northwest crosscut on north line of Exchequer, 1300 level of Ward shaft, is out 127 feet; face is in porphyry.

EXCHAQUER.—The joint northwest crosscut on the north line of Exchequer, 1800 level of Ward shaft, is out 127 feet; face is in porphyry.

NEW YORK.—The south drift from the winze, 50 feet below the 650 level, is out 36 feet; the whole distance is in fair-grade ore. The west crosscnt, 800 level, 110 feet north of shaft, is out 30 feet; face in low-grade quartz.

SILVER HILL.—We are stoping out on a streak of ore on the 260 and 490 levels. Extracted and sent to mill the past week 189 1320-2000 tons of ore from the 260 and 490 levels. Milled during the week 189 1320 2000 tons of ore. Average battery assays, $24.56; average carsample assays, $29.21. Shipped to the Carson Mint, 79½ pounds of crude bullion.

Arabia District.

CLOSAN DOWN.—Reno *Journal*, Oct. 5: J. C. Hampton, foreman of the Arabia mines, near Lovelock, is in town. He says the mines closed down recently on account of the low price of silver, and threw 40 men out of employment. Mr. Hampton, who has had extensive experience in mining in Colorado and Nevada, says the mines would pay well and give employment to a large number of men if silver was anywhere near par.

ARIZONA.

MOHAVE CO. MINES.—*Miner*, Oct. 1: Never before in the history of Mohave county has the mining outlook of this region appeared so promising. From all parts of the country, and especially in the Indian Secret and Minnesota districts, come flattering reports of the steady improvement of the mining industry. A number of capitalists is negotiating for a number of properties in White Hills, and it is thought a sale will be effected in a short time. Parties leasing on the G. A. R. and the Prince Albert mines, in Indian Secret district, in some instances are taking out over $1000 per day. Some of the specimens on exbibition here from the former claim are nearly solid horn silver, and not less rich is the ore from the Prince Albert and a number of other mines in that region. As soon as cold weather sets in, it is thought there will be over one thousand souls in the new town of White Hills and mining will be started in a systematic manner. Conard & Conrad are still packing ore from the Columbus mine to the Flores mill. The Pittsburg mine still continues to send forth its usuel monthly quota of rich silver ore. The Flores mill is still running on good-grade gold ore, turning out bullion and concentrates. James Willard shipped two tons of ore from the Prince Albert mine, White Hills, to the sampler last week, for which he received about $800 net. The Prince Albert mine, White Hills, is showing up rich ore in many places under the developing hands of many leasers. Rich ore can be seen over the greater part of the claim. The Horn Silver mine, in Weaver district, continues to improve with depth. Several cuts have been made across the ledge, and show up the same rich ore the whole length of the claim. A tunnel, now in 20 feet, shows up 14 inches of ore averaging over 300 ounces. Tobe Wilkinson has struck a two-inch streek of ore on a piece of ground neer the Defiance mine, Indian Secret district, running $6000 to the ton. Malcolm McLeish came in from Gold Basin, Wednesday evening. He reports that the first hole started by the company in search of water had to be abendoned and a new one commenced. About 12 feet a day in depth is being made in the new hole, and as the work is now under competent supervision, it is expected that the well will he sunk to water. The G. A. R. mine, White Hills, is making a grand record for itself in the production of rich ore. From shaft No. 1, fully $4000 worth of ore is being taken out daily. The shaft is down about 70 feet, the ore-body being fully four feet in width. At the bottom there is one streak of ore 12 inches in width that will mill over $1000 per ton. Eighty feet east of this sheft, Sheriff Leke has sunk to about the same depth as No. 1, and hes the same rich ore all the way down. The mine so far as developed has no equal on the Pacific coast. Every day hut adds to ite value, and should it continue to show up as well with further depth, it cennot he purchased for $500,000.

COCHISE DISTRICT. — Tombstone *Prospector*, Oct. 8: As a producer of fair grade gold, ex-

cellent-grade copper and shipping grades of silver and lead ores, this district is destined to be a surprise to the most sanguine. The main copper showing of the district lies north of the railroad, in the vicinity of the Peabody and San Antonio. The limestons hills to the east, toward Croton springs, abound in indications that should lead to development, especially in that portion adjacent to the railroad. Just east of the railroad, about a mile and a half, the Golden Rule, Minneapolis, St. Paul, Black Thorn, White Thorn, Relapse and Mountain Key are each and all good healthy prospects, every one showing pay rock, the Golden Rule being a full-fledged mine.

RELAPSE.—West shaft now down 33 feet. The ledge is still narrow, but the ore is of fine grade, galena, black metal and chloride in white quartz matrix.

MOUNTAIN KEY.—This property has been purchased by Mr. Johnson and his associates. As this claim is an easterly extension of the St. Paul-Minneapolis ledge, is already developed by two shafts, one to a depth of a hundred feet, and there is nearly, if not quite, another carload on the dump ready for shipment, it is probable that work will not be pushed on this claim until the combination shaft on the Minneapolis-St. Paul mines has reached the 100-foot level. At about 60 to 90 feet the shaft will cut the ledge on its dip to the south, and the magnificent showing where work has been done on the ontcrop warrants the belief that when the ledge is opened up on the 100 another shipper will he on the hoards.

BLACK THORN.—At a depth of 42 feet in the main shaft the ledge has been stripped to the southwest for a distance of about 20 feet, showing a strength of fully two feet in width of honey-combed, rusty quartz, going well in gold.

IDAHO.

SOME GOOD MINES.—Idaho City *World*, Oct. 8: George Surfleet and A. J. Boyakin have men at work running a tunnel to develop at the depth of nearly 100 feet the Silver Reef mine, on Rush creek, west of the Half-way house, 15 miles below this city. The monntain is so abrupt that the tunnel will have to be driven only about 60 feet. A shaf was sunk to the depth of 10 feet, and ors from it gave average assays of $180, mostly silver. Selected pieces went much higher. The ore contains much native silver. Parallel with ths Silver Reef is the Larkspur, on which they ars also at work. Assays of ore from this mine gave returns of 110 onnces silver and $12.50 gold per ton. The work at present is confined to a surface cut. George Dunnigan and Surfleet will commence development work on the Sunlight in a few days hy resuming work in the tunnel, which will tap it at the depth of nearly 200 feet. There are many very promising locations in the district, and several great mines are sure to be recognized as such after more extensive development work is done. The formation is granite and porphyry and the ledges all carry copper, which is a very desirable feature, insuring permanency. A carload of ore will be shipped to Salt Lake or Omaha soon, with a view of ascertaining just what the ore will yield. Capt. J. D. Channell, who has spent a week among the mines hetween this place and Banner, informs ns that the 600-foot tunnel to tap the Edna mins, in Beaver district, at the dspth of 30 feet, was started nearly a week ago.

NEW MEXICO.

GOLD HILL.—Silver City *Enterprise*, Oct. 1: T. H. Snyder brought in 18 ounces of gold, the result of a mill run on 15 tons of ore taken from the Lottie claim in doing development work; besides this hullion, one ton of concentrates worth $150 was sold. Harry Logue is working successfully on his lease on the Engineer mine. His last mill run, made on a hatch of six tons for a test, returned $125 in gold hullion. The high-grade ore is about six inches in w dth, besides which there is four feet of good milling ore. H. C. Myers is taking out good ore on the Express mine, and will have a mill run made soon. Gold Hill is rapidly coming to the front and will soon he a noted gold camp. Every mine being worked in the camp is paying well. This is something that can he said of no other mining camp in the Weat. Idus L. Fielder last week shipped 65 ounces of gold hullion, the result of a mill run on 82 tons of ore from the Western Belle mine at Gold Hill. In addition to the gold hullion, ahont about $650 worth of concentrates were saved.

COOKS AND HARLEY.—James Martin has a magnificent showing of ore on the Inez, formerly the Montezuma, which had quite a history as an ore producer in the days when John A. Miller and C. P. Crawford were its owners. Immense ore hodies were then extracted, and now the claim promises to repeat its old history. Poe and Ashenfelter are working the Teel and Poe Mining Co.'s property under lease, and are shipping a carload of ore per day. The genial Colonel Milliken is running the Surprise mine on a most excellent and economical plan. He is shipping ahout 15 cars per month and keeping the mine in the hest possihle shape. John Fry, one of the most persistent miners in camp, has a good lease, and will he among the constant shippers from this time on. The shaft on hia property is 80 feet deep with two drifts 20 feet. The development has exposed a great deal of ore, which will amply remunerate him for all expended in development. Jap. Onstott is working his mines on the west side of the mountain and is shipping steadily.

OREGON.

PLACERS.—Bedrock *Democrat*, Oct. 5: Mr. A. H. Tahor is down from Snmpter and reports that his district is keeping pace with the rapid progress of the times and the season now drawing to a close is the most prosperons for years past. The placers have yielded handsomely and the Sumpter district may be depended npon for its full quota of the precious dust. A numher of the old-time placers havs heen worked this season profitahly, and new ground has given good results. Mr. Kimhle has a force of Chinamen at work in his diggings and will continne operations until snow flies. Archie Downie, the veteran miner, has enjoyed a prosperous season, and is now making hi final clesn np. The quartz properties in that section of the conntry are looking up and all indications point to a good future.

WHITE SWAN DISTRICT.—The developments in the White Swan district during the past year prove that it will hecome a rich gold prodncing region. The rich strikes that have heen made in the White Swan, the record of the Virtue in years gone hy, and with the recent developments and showings made in this old-time producer hy the Virtue Mining and Milling Compsny and their willingness to go ahead, the *Democrat* is of the orinion that there is a good future ahead for this district. There are other properties in the White Swan district that are as yet prospects, hut the snrface indications are all that could he desired and they promise to develop into good, substantial mines.

THE MONUMENTAL.—A mining man who has just returned from a visit to Granite and Greenhorn, stated to the reporter that the recent strike in the Monnmental mins was more exteusive than has heen made known. The ledge is over three feet wide and the ore wonderfully rich. It is the gentleman's opinion that the Monumental is a great property, notwithstanding the "black eye" it has so long heen wearing.

MILLING MACHINERY EXPECTED.—Thos. McEwen has the contract for hauling the mill machinery for the North Pole Mining Co. from McEwen to Cracker Creek. It is a hig contract, the machinery weighing between 150 and 200 tons. The plant is expected to arrive in a few days.

THE CARPENTER HILL MINE.—S. J. Fore, who has heen superintending the work on the Carpenter Hill property, informs the *Democrat* that work has heen suspended for the winter. The work accomplished during the past few months was attended with highly satisfactory results, and the company have good gronnds for helieving that they have a honanza. The crosscut exposed a fine 15-inch vein of fres gold. Mr. Fore then drifted for 40 feet on the ledge, which varied in width from 8 inches to 3 feet. In the face of the drift where work was suspended, the vein is ahout two feet wide and a fine hody of ore is in sight. The Carpenter Hill Mining Co. will develop the property on a larger scale next spring and expects to have a mill on the mine hefore the summer is over.

SOUTH DAKOTA.

HAY CBEEK.—De ad wood *Pioneer*, Oct. 6: Ex-Governor Larahee, of Iowa, and H. B. Young, of this city, own extensive and valuable interests in the Hay creek coal fields, which have already heen well prospected and exhibit a large quantity of coal of good qnality. The gentlemen have decided to thoroughly develop their property and place it in condition to allow continuous mining and marketing of coal. Yesterday they awarded a contract for extending the main tunnel on the property a distance of 1500 feet farther. The tunnel has already heen driven 700 feet and its face is in a vein of excellent coal. George M. Nix, who secured the contract for driving the tunnel, went out to the mines.

TWO BEARS.—Two loads of ore from the Two Bears mine in Strawherry gulch were received at the Deadwood & Delaware smelter for treatment yesterday. Shipments of a large amount of ore from this mine to the smelter will probably be made during the next few months.

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Dr.	Cr.		Dr.	Cr.
ARIZONA MINES.			Best & Belcher	—	*16,465
Crocker	—	*1,666	Bullion	—	679
Peer	—	*49	Caledonia	—	4,338
Peerless	—	1,796	Challenge	—	*295
Silver King	*4,340	—	Chollar	—	14,721
BODIE MINES.			Confidence	—	534
Bodie	—	13,810	Con. Imperial	3,396	—
Butwer	—	13,727	Con. Cal. & Va	8,605	—
Mono	—	*1,501	Con. New York	—	4,616
Standard	—	27,930	Crown Point	—	*7,232
Syndicate	—	1,418	East Sierra Nev.	—	12
Summit	2,927	—	Exchequer	—	6,682
TUSCARORA MINES.			Gould & Curry	—	5,375
Belle Isle	*5,608	—	Hale & Norcross	—	23,551
Coptis	—	2,400	Julia	—	5,135
Commonwealth	*26,978	—	Justice	—	3,253
Del Monte	20,372	—	Kentuck	—	1,704
Diana	103	—	Lady Washington	—	5,761
Grand Prize	324	—	Mexican	—	3,690
Independence	* —	—	Occidental	6,627	—
Navajo	*6,659	—	Ophir	—	10,815
Nevada Queen	8,797	—	Overman	19,917	—
North Belle Isle	*12,602	—	Potosi	8 231	—
N. Commonwealth	—	527	Savage	19,793	—
COMSTOCK MINES.			Scorpion	—	4,117
Alpha	—	*535	Sierra Nevada	—	12,923
Alta	—	17,762	Seg. Belcher	—	10
Andes	—	10,935	Silver Hill	—	4,752
Belcher	—	2,133	Union	—	—
Benton	—	34,039	Utah	—	916

*Collecting assessments.

NOTE.—Curry has concentrates valu d at $2000. Occidental has bullion and concentrates on hand value not known. Con. Cal. & Va. has $17,492.02 in bullion, with further shipments to arrive. The Navajo has $1300 due on pumping account.

DR. TILDEN, says the *Gas World*, has made the very important discovery that isoprene (C^5H^8), a liquid prepared by the action of heat upon turpentine, undergoes a spontaneous change in presence of acid and becomes caoutchouc. This artificial caoutchouc is identical with the natural in its composition, consisting of two substances, of which one is more soluble than the other in bisulphide of carbon or benzol, and it vulcanizes in the same way.

Market Reports.

Local Markets.

SAN FRANCISCO, Oct. 13, 1892.

General trade the past week was fairly active in all hranches. While saying this, it must be understood that the activity does not extend much, if any, heyond near-hy requirements. The spirit of conservatism, which has been the characterizing feature of trade, still dominates, and therefore in no line of goods is there any disposition to speculate. As long as this spirit controls, business will be conducted upon a substantial and confidence-inspiring hasis. Eastern mail advices report a strong-growing hut conservative trade. The demand is said to show an enlargement on the call which has ohtained at this season in former years. The New York *Commercial Bulletin*, in referring to trade, says that the volume of husiness was never as great at this season as it is now. But this means a really unusual increase in the distribution of manufactured products, hecause the movement of the largest crops ever grown last year swelled that part of the aggregate far heyond its usual proportions; and as this part was then much larger than it is now, the conclusion is inevitable that the remaining movement of manufactured products must this year he much larger than it was last year.

The local money market is tending to greater ease under fairly free remittances from the interior and no decided demand from any particular branch of trade or speculation. The financial standing, as reported at their annual meetings, of the Bank of California and Nevada Bank, gives evidence of a healthy condition (taking them as a fair example) of San Francisco hanks. Eastern mail advices continue to report a fair degree of activity in the leading money centers, with the call coming mainly from the great grain and also cotton-growing States. While an active money market is reported, yet there does not appear to he any tendency toward friction, and therefore all demands are expected to he met without raising the rates of interest.

The International Monetary Conference is attracting renewed interest. Under the discussion of the obj ct of the conference himetallism appears to he gaining ground, and as it gains in strength the opinion grows stronger that the meeting will result favorahle for himetallism. Probably one of, if not the most important points on bimeta'lism, are the views of Dr. A. Soetheer in a memorandum submitted to the Secretary of Treasury, and a few others interested in the coming monetary conference. Owing to the standing of the doctor and the accepted opinions of his views being feasihle, we give the points in full. He refers to the proposition submitted hy Maurice Levy, the Danish delegate to the International Conference of 1881, that silver be substituted for gold in payments not exceeding two pounds sterling, and that silver notes be issued to ohviate the necessity of carrying about so much silver. Dr. Soetheer considers this scheme likely to receive more careful consideration now than when it was submitted, and he has made important additions to it in the outline of an international monetary treaty which he has drawn up for the consideration of the Brussels conference. The plan defined by Dr. Soetheer, as translated at the Treasury Department, is as follows:

1. Recognition of some definite weight of fine gold as the universal foundation of the measure of value of monetary system.

2. Maintenance of the existing gold monetary systems of the various countries; cessation hy them of the further coinage and issue of gold coins under 5.8065 grams of fine gold (20-franc piece); ohligations of such countries to retire their smaller gold coins within the next ten years.

3. Uniform gold coinage charges of 2 per 1000.

4. Issue of gold certificates for gold deposited, by the principal mints or central hanks, for amounts of 500 grams of fine gold or multiples of that amount. Agreement on a uniform mode of assaying.

5. Retirement within the next ten years of all hank notes hitherto issued in the country and of other paper money of a value under 5.8065 grams of fine gold, and refusal to issue any longer either hank notes or other paper money under said value in gold.

6. Retirement of existing silver coins of a higher nominal value than 10 per cent of the value of the lowest future standard gold coin, witbin the next 15 years, and hereafter exclusive coinage of the principal coins in the value ratio of silver to gold 20 to 1. Coinage of the same only on account of the Government. Each country to retain its freedom as to the coinage of small divisional coins.

7. Obligation of the Government of each country to receive into its public treasuries the principal silver coins bearing their own stamp in payment of all sums.

8. Ohligation of private individuals and moneyed institutions to accept the principal silver coins of the country in payment to an amount equal to three times the value of the lowest standard gold coin.

9. Issue of silver certificates by the principal mints or central banks, against the deposit of the full value of the face thereof in the principal silver coins, in denominations not lower than one-half of the value of the lowest standard gold coin, and also in multiples of such amount. The immediate specie redemption of the silver certificates in principal silver coins, on demand and at all times at places of issue.

10. No issue of credit notes payable in silver only.

11. Ohligation of the several Governments, within eight weeks after the close of the calendar year, to inform each other of all the laws, regulations and proclamations issued hy them, within their respective domains, with relation to the monetary systems, as well as of the coins retired and of new coinages.

12. Liherty of each State to recede from this monetary treaty after 12 months' notice.

SILVER—The market the past week ruled strong at slight advances, closing with the tendency still upward. The statistical position of the metal and a growing impression that the monetary conference will report favorable on bimetalism, are the leading factors in promoting the strength. The stock of silver in England is very light, and to meet any demand from India, or elsewhere, the United States has to be called on for supplies, and as this country is now huying in excess of the production, our surplus stock is running down. During the first nine months of the calendar year there was exported from San Francisco $2,019,530 in hullion, against $473,219 during the like time in 1891.

MEXICAN DOLLARS—The market is firm at around 67½c. The exports from San Francisco during the first nine months in the calendar year aggregate $6,117,841, against $4,344,258 during the like time last year.

QUICKSILVER—Receipts the past week aggregate 524 flasks. The market is easy in sympathy with foreign and Eastern advices.

BORAX—Receipts the past week aggregate 2285 ctls., and exports by sea 2011 ctls. The market has held to steady prices.

LIME—Receipts the past week aggregate 11,252 bbls. The market is irregular under strong competition; Quotations are given at $1.20 to $1.50 per bbl.

ANTIMONY—The market is essentially unchanged. New York advices report more trading, with the market firmer at the follow ng quotations: 10½c@10¾c for Hallett's, 11c for LX, 11¼c for Crown and 11½c@11¾c for Cookson's in round lots.

PIG LEAD—The market is weak in sympathy with Eastern advices reporting heavy markets with supplies large.

TIN—The market for hoth pig and plate is dull, but holders, so far as we are able to learn, are not making concessions. New York advices report for pig an uneasy and unsettled market. This feeling is due to foreign advices regarding the supply and demand, and the market under control of leading manipulators. London cables report free purchases of plate for San Francisco.

COPPER—The market strengthened the past week. The New York market is telegraphed at quite an advance. The up move is due to large huying at New York and also in England for October, Novemher and the year. The New York buying was hy large consumers. London cahles to *Iron Age* are as follows: "Copper advanced 15@20s on improved demand for speculative account and better purchases for consumption, together with good demand from England and the Continent. European visible supply has decreased 1236 tons during the past month."

PIG IRON—The tone of the market appears to be improving in sympathy with stronger markets at the East ank ahroad. New York mail advices report an increasing call at all large distribution points.

COAL—Imports the past week aggregate as follows: Departure Bay, 2700 tons; Card ff, 2995; Seattle, 1800; Sydney, 2518; Newcastle, N. S. W., 4154; New York, 200. Total, 14,367 tons. The stock of coast coal is light, hut as the output of the mines is liberal, free supplies can he had at any time. The consumption is increasing. Steam coal on spot and due is firm. For loading, higher prices are quoted owing to higher freights demanded.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb	— @ 13½	English, lb	— @ 18
BORAX.		Canton tool	— @ 8½
Refined, in car lots	— @ 7½	Bl'k Diam'd tool	8½@ 16
Powdered, do	— @ 7½	Pick & Hammer	8½@ 10
Concentrat'd, do	— @ 6½	Machinery	4 @ 5
All grades jobbing at advance.		Poe Calk	— @ 4½
COPPER.		TINPLATE.	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 6 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 6 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @11 76
IRON.		PIG TIN.	
Bar, base	— @ 3	Spot & lb	— @ 23
Norway, base	— @ 4½	COAL.	
PIG IRON.	Spot.	SPOT FROM YARD—PER TON.	
Eglinton & ton	22 00@— —	Wellington	$8 00
Glengarnock	23 00@— —	Greta	7 50
Am. Soft, No. 1	24 00@— —	Nanaimo	7 00
Oregon Pig	— —@— —	Gilman	6 00
Puget Sound	— —@— —	Seattle	6 50
Olay Lane White	24 00@— —	Coos Bay	5 00
Langloan	22 00@— —	Cannel	8 50
Thorncliffe	23 00@— —	Egg, hard	12 00
Carnbarrie	22 00@— —	Cumberland, in sacks	15 00
Barrow	22 00@— —	Do, bulk	14 00
Cargoffeet	22 00@— —	Wallsend	7 25
OHROME IRON ORE.		Scotch Splint	7 50
Per ton	10 00 @— —	Brymbo	7 50
LEAD.		West Hartley	7 50
Pig	— @ 4½	20 LOAD—PER TON.	
Bar	— @ 5½	Australian	6 00@— —
Sheet	— @ 7	Liverpool Steam	6 25@— —
Pipe	— @ 6½	Scotch Splint	6 25@— —
SHOT.		Cardiff	6 50@— —
B, & bag of 25 lbs	8 @ 85	Lehigh Lump	15 00@— —
Do do, B and *larger* sizes & bag of 25 lbs	2 10	Cumberland	13 00@— —
Buck, Balls and Chilled do, & bag of 25 lbs	2 10	Egg, hard	11 00@— —
QUICKSILVER.		West Hartley	7 00@— —
Home trade, pr. flask	41 00 @41 50	COKE.	
For export	35 00 @35 50	English, to load	$8 00@ 9 00
		Do, spot, in bulk	—@10 00
		do, in sacks	—@12 00
		Cumberland	9 00@— —

Eastern Metal Markets.

NEW YORK, Oct. 12.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38⅜	83¾	11 25	4 00	20 40
Friday	38⅜	84	11 25	4 00	20 45
Saturday	38⅜	84¼	11 25	4 00	20 45
Monday	38⅜	84⅜	11 75	3 90	20 55
Tuesday	38⅜	84⅜	11 75	4 00	20 75
Wednesday	38⅜	...	...	...	...

Quicksilver continues easy. Borax is steady, with a good demand. Pig lead is barely steady. Copper is firm at an advance, under a free demand. Pig tin is doing better under strong manipulation.

Mining Share Market.

SAN FRANCISCO, Oct. 13, 1892.

The market the past week, under review, disappointed those chronic bulls who had confidently looked for better things, but conservative operators appear to be more than pleased at the way in which shares have been handled. They appear to see in it the earmarks of former deals, and in taking this view of the situation, they are quite hopeful of a coming deal, but not of a market. In this opinion the writer is more than hal inclined to take the same view of the situation, but whether the coming deal will come before or after election, or how much lower prices will first be dragged, are beyond our ken; but that a deal has been or will be planned is morally certain, for the mill-rings and stock-pools have too many shares on which to pay assessments, and these shares they will generously divide with outsiders, but at higher prices than are now quoted. Why we think they will send prices higher than are now current is grounded on seemingly authentic information, and also from personal observation that the rings' holdings average higher than the prices of shares now average; and it is not at all unreasonable to suppose that the rings will sell for less money than the shares cost. While firmly believing in a deal, yet the writer again warns patrons of the PRESS against venturing in, for the up-move will more than likely be similar to that made last month—very short-lived, hardly long enough around the high prices to let outsiders unload. If the mines were differently managed, and the ore honestly worked so as to fully conform to the law under which the companies incorporated, then the situation would have an entirely different look, and an outsider could invest in the shares with a reasonable assurance of getting dividends, for there is hardly a mine on the Comstock but can be made to pay dividends. Mine managers in this State (outside of the Bodies, which are said to be controlled by members of the Comstock mill-rings) make money out of mines, the ore from which does not assay one-sixth as high as does the ore extracted from Comstock mines, which are made to run in debt. It is a great game, this, of working the Comstock mines.

One of the most reassuring signs of the times, and which app ars to have a silver lining for outside shareholders, is the decision of Judge H bbard denying the defendants in M. W. Fox's suit against the Hale & Norcross directors a new trial. The judge quite properly gives H. M. Levy a severe castigation, and at the same time virtually says that other directors of the company were derelict in their duty by not looking more closely into the way in which the mine had been worked and the ore milled, and in being derelict in their duty to *all* shareholders, they became amenable, both civilly and criminally, to the laws of California. This is not the exact wording of the judge's decision, but, taking his former decision in the suit in connection with the last, the above virtually covers the situation. That the suit has made a change for the better in the management of some of the mines is witnessed in that of the Potosi. Now the mine is making money, whereas before it ran in debt. While the earnings are small, yet they are far better than running behind. In this connection, we will cite the returns for the past week of the Potosi, and also that of the Savage (the ore from both mines is reduced at the same mill). The Potosi had 365 tons of ore milled, which assayed as follows: Car sample, $24.75; battery, $24.08; difference 67 cts. The Savage had 525 tons milled which assayed as follows: Car sample, $22.35; battery, $20.76; difference, $1.58. And this is the smallest difference yet made under the reform (?) management of George Wells and H. Zadig. Alvinza Hayward, who is said to control Potosi, has had some experience, as in the Hale & Norcross suit, but J. L. Flood, who, if it is correctly stated, controls Savage, evidently has not. It is asked by more than one person why the Mining Stock Association does not enlighten him.

The share market opened this morning fairly active, but at slightly lower prices. After Cal prices hung around for a short time, then advanced slightly and closed steadily.

The ore reduced last month at the Nevada mill for the Savage Mining Co. returned 73 per cent in bullion, and that reduced at the same mill for the Potosi Mining Co. returned 89 per cent. It looks as if the directors of the former company want "an experience" similar to what the late directors of the Hale & Norcross had.

The market for outside mining shares has been more active in the Quijotoas at a slight advance. The Bodies have been dull but steady, as have the "razor blades" (the Tuscaroras).

Private advices from the Comstock mines are of an encouraging character. The general tenor indicates that in several, they ought soon to be in position to report new strikes. These new strikes are almost invariably ore run into years ago, and after answering the mill-ring's purposes, was neglected and, by the public, forgotten, but is to be again brought forward for use. It looks as if there are too many shares on hand for the comfort of the rings, and therefore anything which will help to unload will be acceptable. In Belcher they are preparing to stope ore for milling. Yellow Jacket and Crown Point have large quantities of good-milling ore ready for reduction. It is also said that Confidence, Challenge and Con. Imperial have considerable ore ready for milling. It is said that all the public will get out of the bullion will not be likely to pay for even a decent meal, unless the present system of working the mines and milling ore be changed to conform to the law under which the companies incorporated. Extensive and important work is being done in several of the Gold Hill, middle and north-end group of mines. Much of this is still kept back, or when reported is only touched on as if it were the merest accident and cuts no important figure.

It is reported that the mills on Carson river are to start up next week on ore from two or more of the Gold Hill mines.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co, Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 4, 1892.

483,975.—VEHICLE AXLE—O. W Beach, South Riverside, Cal.

483,733.—BROOM GUARD—H. J Bennett, S. F.

483,891.—CIGAR LIGHTER—J. R. S. Birch, San Diego Cal.

483,901.—ROCK DRILL—A. Chodzko, S. F.

483,956.—MACHINE FOR REDUCING BRASSES OF JOURNALS—E. Ferris, Alta, Cal.

483,978.—BARREL STAND—H. H. Fisk, Florence, Or.

483,606.—DEVICE FOR CONTROLLING LIGHT FOR PHOTOGRAPHIC PURPOSES.—A P. Fleglor, S. F.

483,765.—DERRICK FORK—G. L. Laughton, Reno, Nev.

483,989.—COIN-OPERATED OPERA-GLASS RECEPTACLE—J. J. McDade, S. F.

483 851.—RAILWAY-CAR VENTILATOR—A. Minnick, Colton, Cal.

483,745.—ELECTRO-THERAPEUTICAL INSTRUMENT—J. W Moliere, S. F.

483 856.—ELECTRIC RAILWAY—W. G. Murphy Jr., Marysville, Cal.

483 724.—FOLDING-BED—W. B. Noyes, S. F.

483 861.—WASHING MACHINE—C. Osbon, Flagstaff, A. T.

483,748.—APPARATUS FOR MAKING MALT—W. A. Peters, S. F.

483 677.—HINGE SEAL CUTTER—G. W. Scott, Santa Rosa, Cal.

483 948.—SANITARY SEAL FOR COVERS OF TOILET VESSELS—C. Smart, S. F.

483,796.—WINDOW-SHADE SUPPORTER—S. T. Stuver, Puyallup, Wash.

483,950.—AWNING—H Vayre, S. F.

483 775.—CABLE RAILWAY GRIP—C. Vogel, San Anselmo, Cal.

483 774—CABLE RAILWAY GRIP—C. Vogel, San Anselmo, Cal.

483,754.—HARNESS SADDLE PAD—R. Whitman, Oakland, Cal.

21,875.—DESIGN FOR BADGE—A. T. Hatch, S. F.

The following brief list by telegraph, for Oct. 11, will appear more complete on receipt of mail advices:

George W. Brodheck, Los Angeles, beer-smoker; Alexander O. Brown, San Francisco, hook or musical holder; Winfield Curtis, Oakland, rail joint; David Dorward, San Francisco, tubular metallic pole; Charles S. Fay, San Francisco, sash fastener; George Ferguson, Los Angeles, hose hand; Joel A. Hayes, Carson City, Nevada, electric arc lamp; George C. Howell, Alameda, fruitpitter; Robert B. Moore, San Francisco, suspension hook; William P. Nolan, San Francisco, ratchet drill brace; William Radford, San Jose, continuous kiln; Chris. C. Reynolds, Kelseyville, cultivator and pulverizer; William W Ryder, Alsea, Or., saw-tooth swage; James M. Schofield, Merced, wooden liquid containing vessel; James Scott, Bethany, Cal., hame clip; Philip Sullivan, Tuscarora, Nev., fire escape; Jefferson D. Todd, Chico, Cal., sheep shears; Daniel Waide, San Francisco, book binding; Milo G. Wheeler, North Yakima, Wash., force pump and water elevator; Daniel C. Wilgus, Los Angeles, lawn sprinkler; James C. Plunket, Oakland, door fastener.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BROOM-GUARD.—Harry J. Bennett, S. F. No. 483,733. Dated Oct. 4, 1892. The object of this invention is to provide a guard for a broom, which is adapted to be readily applied and easily removed for use on another broom, and which, when in use, will protect and stiffen the straws and prevent them from turning and wearing unevenly, and which can be adjusted up or down to accommodate the wear and to permit the projection of so much of the broom-end as may be found best for different purposes.

CONTINUOUS FILE OR INDEX.—Alexander J. Rndolph, S. F. No. 483,312. Dated Sept. 27, 1892. This continuons file or index is an improvement on a former patent to the same inventor—No. 473,348, dated April 19, 1892. It consists of a series of cards, the faces of which are adapted to receive the slips containing the subject-matter of the index, said cards being hinged or linked together at their edges to form a flexible belt, and in conjunction with these cards, pins projecting from the edges of certain ones, and a support upon which these pins are carried so that the cards hang in folds of any desired length upon the support. With this device is employed a drum or other means for moving the index-sheets from one side to the other of the unspending-frame. The whole device may be so enclosed either to be invisible or with glass sides and a glass top is preferably provided, through which the cards may be inspected without opening the case or handling them. By this construction the inventor greatly simplifies the construction of an index, with few working parts and an ability to increase it to any extent, and still keep up the alphabetical order.

FOLDING-BED.—Walter B. Noyes, S. F. No. 483,724. Dated Oct. 4, 1892. This is one of that class of folding beds in which the mattress frame is pivoted to a fixed frame and is adapted to turn from a vertical or closed position to a horizontal position for use. The invention consists in the novel connection between the mattress frame and the main frame, whereby the former is accurately balanced in the novel supporting-leg for the outer end of the mattress frame, the novel means of supporting the woven-wire fabric, and other details of construction. The principal object of the invention is to provide a folding-bed in which the mattress frame can be easily opened and closed by reason of a spring connection with the main frame which accurately balances it.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 21.		WEEK ENDING Sept. 28.		WEEK ENDING Oct 5.		WEEK ENDING Oct. 12.	
Alpha	.25	.35	.30	.50	.30	.40	.35	.50
Alta	.25	.55	.40	.65	.30	.50	.35	.50
Andes	.45	.70	.55	.90	.55	.75	.70	.80
Belcher	1.70	3.20	3.10	6.50	2.95	4.55	3.10	4.25
Belle Isle	....	....	.15	....	.15	....	*.15	....
Best & Belcher	1.30	2.75	2.65	3.30	2.00	2.9	2.25	2.45
Bullion	.45	.85	.85	.95	.60	.75	.60	1.05
Bodie Con	.40	.45	.45	.60	.25	.40	.30	.35
Bulwer	.35	.35	.35	.50	.35	....	.30	....
Commonwealth	....	....	.05	....	.05	....	.10	....
Con. Va. & Cal	3.10	4.20	3.65	5.00	3.60	4.50	4.00	4.45
Challenge	.35	.85	.70	1.50	.80	1.05	.90	1.15
Gholiar	.60	1.15	1.00	1.60	.80	1.40	.95	1.30
Confidence	2.25	3.25	3.00	3.60	1.85	2.50	2.15	3.00
Con. Imperial	.05	....	.10	....	.05	.10	.05	....
Caledonia	.20	.35	.30	.45	.20	.30	.20	.35
Crown Point	.65	1.30	1.20	2.25	1.15	1.65	1.15	1.60
Crocker	.10	....	.10	....	....	....	....	....
Del Monte	....	....	....	....	.05	....	....	....
Eureka Con	2.00	....	1.90	2.0	2.00	....	....	....
Exchequer	.20	.39	.30	.40	.20	.30	.30	.40
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.95	1.50	1.30	2.00	1.15	2.00	1.35	1.55
Hale & Norcross	1.50	2.65	2.30	4.15	2.15	3.50	2.05	2.30
Julia	.10	....	.10	.20	.10	.15	....	....
Justice	.20	.35	.30	.45	.30	.35	.25	.30
Kentuck	.15	.30	.25	.40	.15	.30	.20	.30
Lady Wash	.10	....	.15	.25	.10	.15	.10	.15
Mono	.10	....	.20	....	.15	....	.10	.15
Mexican	1.30	2.15	1.80	2.8	1.80	2.40	1.85	2.10
Navajo	....	....	.15	....	.15	....	....	....
North Belle Isle	....	....	.05	....	.05	....	....	....
New Queen	....	....	.15	....	.10	.15	.10	....
Occidental	.30	.5	.40	.55	.30	....	.30	.35
Ophir	2.30	3.20	2.95	4 05	2.75	3.4	3.00	3 30
Overman	....	.95	.70	1 65	.70	1.15	.70	1.10
Potosi	.65	1.15	.95	1.70	.80	1.45	.95	1.45
Peerless	.10	....	.10	....	.05	.10	.10	....
Peer	....	....	.15	....	....	....	.10	....
Savage	.85	1.65	1 30	3 00	1.50	2.50	1.30	1.75
S. B. & M	.35	.75	.65	1 15	.55	.80	.55	.75
Sierra Nevada	1.75	2.60	2.20	3.10	1.90	2.50	2.00	2.30
Silver Hill	.10	.20	.20	.35	.20	.25	.20	.25
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.35	1 95	1.55	2.15	1.25	1.8	1.55	1.70
Utah	.35	.45	.35	6	.30	.45	.30	.35
Yellow Jacket	.60	1.15	1.00	1.85	.80	1 35	*1.10	1.60

*Assessment added

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

FULTON ENGINEERING AND SHIP-BUILDING WORKS. Capital stock, $1,000.000. Directors—Daniel B. Hinckley, Daniel E. Hayes, James Spiers, R. D. Chandler, H. P. Christie, L. C. Bresse and Frank A. Huntington.

PACIFIC GROVE ELECTRIC LIGHT AND POWER Co. (Pacific Grove, Monterey County.) Capital stock, $60.000. Directors—Nathan C. Carnall, George W. Hopkins, H. N. Bryant, H. E. Kent and Wm. H. Chapman.

OCCIDENTAL ALKALI Co. Capital stock, $600,000. Directors—F. Conn, E. Trude, R. J. Laws, S. A. Knapp and E. G. Knapp.

SAN FRANCISCO MARINE BOARDING MASTERS' ASSOCIATION AND SHIPPING AGENCY. Capital stock, $10,000. Directors—Niles Nelson, John Rogers, J. W. Wilson, Henry Brown, Samuel Winn, Cosmos Constantine and Peter Gaffney.

FREDERICKSBURG BOTTLING Co. Capital stock, $100,000. Directors—Otto Lang, August Lang, L. Lang, L. Mohlfeldet, Gustav Liehold. L. G. Scmidtt, Diedrich Todt and Heinrick Kracbt.

GROCERS' SUNDRIES MANUFACTURING Co. (Los Angeles). Capital stock, $24,000. Directors—C. S. Kions, Justus Kraft, F. J. Oshorne, Frank Humphreys and H H. Yerrington.

REDLANDS ELECTRIC LIGHT AND POWER Co. (Redlands, San Bernardino Co). Capital stock, $200,000. Directors—Geo. B. Ellis. H. H. Sinclair, Geo. H. Crafis, F. J. Ferand, G A. Cook, R J. Waters and James F. Drake.

TEHACHAPI LIGHT AND WATER Co. (Tehachapi, Kern Co.) Capital stock, $25,000. Directors—W. T. F. Smith, D. W. Madden, J. B. Beckwith, G. L. Robertson and Emmet Barber.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2, Oct 6, Oct 27		C E Elliott, 3 9 Montgomery
Belle Isle M Co, Nevada	15	10c	Aug 22, Sept 26, Oct 20		J W Pew, 310 Pine
Brunswick Cons G M Co, Cal forula	4	2c	Sept 29, Oct 31, Nov 17		J Stafield Jr, 3 9 Montgomery
Challenge Cons M Co, Nevada	12	10c	Aug 24, Sept 27, Oct 18		C L McCoy 331 Pine
Commonwealth Cons M Co, Nevada	9	10c	Sept 7, Oct 13, Nov 9		R R Grayson, 336 Pine
Cons Pacific M Co, California	14	10c	Sept 29, Nov 5, Nov 30		F E Luty, 330 Pine
Crocker M Co, Arizona	12	5c	Aug 11, Sept 20, Oct 18		A Waterman, 3 9 Montgomery
Crown Point M Co. Nevada	58	25c	Sept 15, Oct 20 Nov 10		J Newlands, 331 Pine
Derbec Blue Gravel Co, California	10	10c	Sept 11, Oct 17, Nov 7		T Wetzel 320 Sansome
Eureka Con Drift M Co California	5	0c	Sept 19, Oct 24, Nov 14		D M Kerr, 330 Pine
Ey ning Star M Co, California	6	2c	Oct 10, Nov 17, Nov 29		J J Scoville, 320 Sansome
Gray Eagle M Co, California	30	6c	Sept 28, Oct 31 Nov. 21		A W Barrows, 303 California
Inyo Marble Co, California	18	50c	Sept 2, Oct 22, Dec 1		A F Thane, 137 Montgomery
Jack Rabbit M Co. Nevada	1	5c	Sept 17 Oct 19, Nov 8		T Wetzel, 320 Sansome
Kentu k Cons M Co, Nevada	5	10c	Oct 3, Nov 8, Nov 29		J W Pew, 310 Pine
Keystone Con M Co, California	3	1	Aug 22, Sept 26, Oct 18		J H Isham 310 Pine
Mono M Co, California	32	5c	Sept 15, Oct 24, Nov 14		H D Walker, 3 9 Montgomery
North Belle Isle M Co. Nevada	20	10c	Sept 1, Oct 6, Nov 7		J W Pew, 310 Pine
Northwestern G M Co, British Columbia	5	20c	Aug 17, Se, t 25, Oct 15		F Bonacina, 438 California
Overman M Co, Nevada	65	3c	Oct 5, Nov 10, Nov 30		G D Edwards, 414 California
Savage M Co, Nevada	79	50c	Oct 7, Nov 9, Nov 29		E B Holmes 3 9 Montgomery
Silver Kings M Co, Arizona	9	25c	Aug 26, Oct 7, Nov 4		J W Pew, 3 0 Pine
Yellow Jacket M Co, Nevada	52	25c	Sept 5 Oct 7, Nov 11		W H Blanvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Alpha Coos M & M Co, Nevada	Annual	C E Elliott, 309 Montgomery	Oct 25
Cons Cal & Va M Co, Nevada	Annual	A W Havens, 3 9 Montgomery	Oct 17
Con Cal & Virginia M Co, Nevada	Annual	H P Bush, 216 Bush	Oct 17
Exchequer M Co. Nevada	Annual	C E Elliott, 309 Montgomery	Oct 17
Mayflower Gravel M Co, California	Annual	D M Kent, 330 Pine	Oct 17
Teresa M Co	Annual	K T Willats, 309 Market	Oct 21
Tepezella Copper M Co	Annual	J W Pew, 310 Pine	Oct 26

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulw r Cons M Co, California	10	L Osborne, 309 Montgomery	April 28
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Oct 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 26

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

STOCKHOLDERS' MEETING

Office of the Superior Mill & Mining Co.

Notice is herehy given that a meeting of the stockholdere of the Superior Mill and Mining Company will he held at the office of the Company, No 303 California street, Room 11, on Saturday the 29th day of October, 1892, at the hour of one o'clock, P. M., for the purpose of electing a Board of Directors until the next annual meeting, and for the transaction of such other business as may come before the meeting.

The Annual Election, not having taken place at the time appointed, and no call therefor having been made or published, and the Corporation having no Secretary, this meeting is called and notice thereof given to the Stockholders by the President of the said Corporation.

D L. MUNSON, President.

Office, Room 11, No. 303 California St., S. F., Cal.

DELINQUENT SALE NOTICE.

KEYSTONE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of Works, Amador City, Amador County, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 3) levied on the 22d day of August, 1892, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
John S. Haver	11	233	$233 00
John S. Hager	130	100	100 0
M J McDonald	137	500	500 0
E. D. Rue, Trustee	138	025	9 5 00

And in accordance with law, and an order of the Board of Directors, made on the 22d day of August, 1892, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 310 Pine St., Room 43, San Francisco, California on TUESDAY, the 18th day of October, 1892, at the hour of 12 o'clock M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

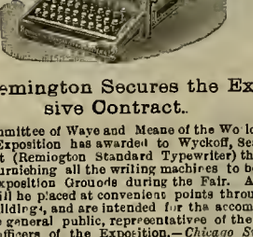
J. H. ISHAM, Secretary.

Office, 310 Pine St., room 43, San Francisco, Cal

REMINGTONS

AT THE

COLUMBIAN EXPOSITION.



The Remington Secures the Exclusive Contract.

The Committee of Ways and Means of the World's Columbian Exposition has awarded to Wyckoff, Seamens & Benedict (Remington Standard Typewriter) the contract for furnishing all the writing machines to be used on the Exposition Grounds during the Fair. A large number will be placed at convenient points throughout all the buildings, and are intended for the accommodation of the general public, representative of the press, and the officers of the Exposition.—*Chicago Sunday Herald, Aug. 7, 1892.*

The World's Fair Commission already use over 100 REMINGTONS in their own work.

G. G. WICKSON & CO.,
3 & 5 Front St., San Francisco, Cal.

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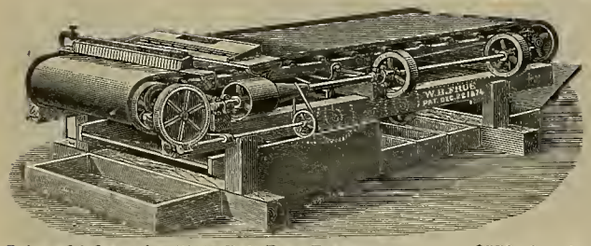

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; and March 31, 1891.

SAN JACINTO ESTATE, LIMITED,
Office of General Manager,
P. O. Address, South Riverside, San Bernardino Co., Cal.
CAJALCO, Dec. 18, 1891.

MESSRS. ADAMS & CARTER, 132 Market Street, San Francisco, Cal.—GENTLEMEN: After a continuous trial of different concentrators comprising the Frue Vanner, the "Holland," "Paradox," "Triumph" and the "Woodbury" concentrators), extending over several months, we find that we prefer the Frue Vanner, as it is easier of adjustment, runs smoother, has less wear and tear, and—having a positive travel—gives less trouble than the other more complicated and ever changing machines now in use here. The Frue Vanner not only saves a cleaner concentrate, but has less loss in the tailings, and is in several ways preferable to the other concentrators here.

I am, my Dear Sirs, Yours faithfully,
S. HARRIS, Manager.

Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
" " " Improved Belt Frue Vanner..... 800, f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 800, f. o. b.

For any information, or for pamphlets, or for circulars or testimonials, call on or address

H. J. SUMMERHAYES, Successor to Adams & Carter, Agent for the FRUE ORE CONCENTRATOR.
No. 132 Market Street. - - San Francisco, Cal.

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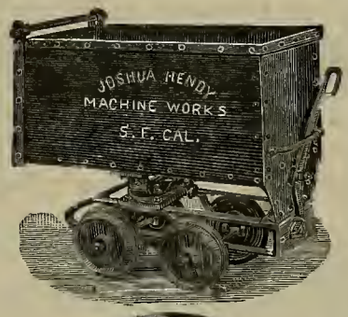

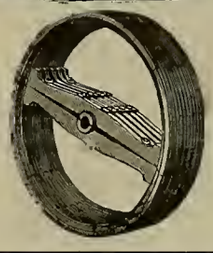

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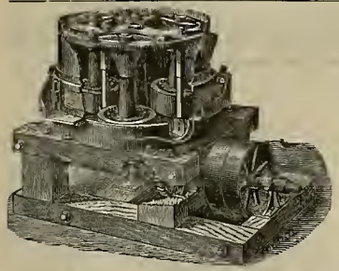

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CALIFORNIA

No Sale for Mining Properties in England.

We have been favored by the perusal of letters recently received from London from a high authority on mining matters, which give a very discouraging account of the state of the mining market for the sale of mining properties in London. We are not surprised at this, when we notice from time to time the results of the disastrous management of English properties in America, properties, too, that had, anterior to the sale to foreign capitalists, paid regular dividends.

It seems to be fatal to the success and prosperity of a mining property to have it pass into English hands, when subject to the proverbial extravagant administration of an English board of directors, English superintendents, and managed at arm's length from a London standpoint. The odium of failures to make these properties pay is thrown upon us, it being asserted often that the property did not justify the price paid or that there was gross deception in the transaction. In fact the poor Yankee has to stand the odium of the failures due to bad management, and a succession of such failures to make our mines pay after passing into English hands has created such a prejudice in the English market that it has made it simply impossible to dispose of properties in that direction.

The fact that no property is ever purchased by an English syndicate except on the favorable report of their own engineers does not seem to be taken into account. It is a well known fact that these engineers rely solely on their own judgment, unaided by the superior opinion of our own experts, who are much more familiar with the characteristics of our mining regions and are, by reason of long experience, much better calculated to report on our mines intelligently; but even they cannot be held responsible for subsequent bad management of properties, that under our more practical methods would make such mines pay satisfactory dividends.

The mines which English experts are sent out to find are exceptional ones, and are very scarce. In fact, such are not in the market. They are firmly held by our own capitalists, who are satisfied to hold them for their own profit. It is unnecessary to send such abroad, as there is plenty of capital to take up this class of mines at our own doors.

It is commonly the case that only properties partially developed, or which are of doubtful value, are sent to London for sale. This fact seems to have dawned upon the minds of English capitalists, hence they decline to waste time in investigation, and the few that are disposed to make investments in our mines send out their own experts in search of a class of properties that owners are not disposed to part with unless at exceptionally high rates.

The principal cause, however, of the failure of the mines they have hitherto purchased is the excess of capitalization over any possibility of a satisfactory dividend. An English prospectus reads like a romance, and promises of large dividends are made far beyond any reasonable possibility of paying. It seems an impossibility for English promoters to limit the capitalization of a mining property to a reasonable amount on which it would be possible to pay dividends. It is therefore excessive capitalization and bad management which causes these constant failures, that we read of, to make American mines pay; and this is very generally the case in nearly every instance as well in their investments in African mines.

The best policy for our mine-owners is to go to work to develop their properties, and when they have done so, they can, if proving worth attention, look for purchasers at home, and not waste time and money in seeking a market abroad.

AT the annual meeting of the Nevada Queen Mining Company, 77,000 shares were represented, and the following officers elected: P. C. Hyman, president; Thomas Cole, vice-president; and Thomas Bell, G. W. Grayson and Wm. Bowen, directors. R. R. Grayson was reelected secretary and F. F. Coffin superintendent. The financial statement showed an overdraft of about $9000, but has an offset ore valued at between $13,000 and $15,000.

THE San Francisco Stock and Exchange Board has declared a dividend of $50 per seat, amounting to $5000.

Starting a Quarry.

The quarrying industry of California has been making great strides in the past few years. The amount of capital invested and number of men employed have largely increased, as have the number of quarries. In the larger cities, business blocks use a great deal of stone and the quarries all over the State have become valuable properties, especially where near suitable means of transportation.

On this page is an engraving showing the method of starting a quarry by the channeling process. This process in stone quarries is decidedly an American invention. It was first applied some 30 years ago to the marble quarries of Vermont, and at first its application was confined to marble. Lately its use has extended to limestone, sandstone, serpentine, slate, and to a limited extent to granite. The channeling process is not what it is popularly supposed to be; that is, it is not a process by which a bed of stone is cut up in the quarry as ice is harvested. Only those inexperienced in the channeling process apply it universally to a quarry-bed.

STARTING A QUARRY WITH INGERSOLL-SERGEANT MACHINERY.

The most useful application of the channeling process is to marble. Marble cannot be quarried successfully by blasting. Marble exists in solid masses, and in order to get at it, it must be cut up in the quarry. At no time in a quarry is it necessary to cut all around the four sides of a block suitable for lifting under the derrick, except when taking out the key-block.

Sandstone quarries and some limestone quarries are usually laid in free beds. This reduces the amount of channeling required. When the beds are thick, say upward of five or six feet, more channeling is required than with light beds. In everycase a great deal must be left to the judgment of the quarry foreman. The channeling process is of great value in saving stock; in directing the process of quarrying so that the best veins may be operated, and in increasing the capacity of the quarry. It also enables us to quarry stone without subjecting it to the shock of blasting. It assists in enlarging the quarry floor, which would otherwise grow less as the quarry gets deeper. It does not pay to quarry granite by the channeling process. A limited amount of channeling is done in many granite quarries, but it is confined to the walls, key-blocks, sumps, etc. The Ingersoll-Sergeant Drill Co., of which Parke & Lacy are the coast agents, build several varieties of channeling machines, adapted for use in quarry work. The machines cut the channels and keep the quarry in regular shape, so the blocks are removed ready for the market. The quarry is kept in a series of benches and there is little waste of rock.

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CHAS. G. YALE, } ..... EDITORS
ALFRED HOLMAN ..... MANAGER

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Our latest forms go to press on Thursday evening.

San Francisco, Saturday, October 22, 1892.

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Comment.

We have received several inquiries of late concerning the Crocker trip-hammer battery for crushing ores. This was a small machine, worked by hand, which was in use in this State 20 years ago, and was manufactured by the inventor in this city. There are none now on the market as far as we have been able to learn; at least, none are being made in this city.

Prof. Barnard, of the Lick Observatory, has discovered a comet hy means of photography. He is engaged in making star maps with a camera, and on one of the plates noted a fuzzy appearance made apparently by a moving object. The appearance on the plate did not denote a nebula, hut a comet; and, sure enough, telescopic observation at the spot indicated showed the comet. This opens up a new field of astronomical observation. This is the first time such a discovery has been made by mechanical means, and Prof. Barnard still further adds to his well-earned fame by making this discovery.

A correspondent asks us about the Pielsticker process and what it is. This is a new process owned by the Cyanide Gold Recovery Co. of London, which has been formed to work the patent. It is claimed for the new process that it has advantages in advance of any other cyanide process, that the method of working has been considerably simplified and the cost reduced, and that difficulties hitherto unsolved have been successfully overcome, and the syndicate announces its readiness to grant licenses to approved companies at a reduction of 50 per cent on the royalties charged for any other cyanide process. It is being introduced in Australia and South Africa and will shortly be brought to our attention here, when we shall he able to give some details of its operation.

In the death of Thomas Bell of this city the mining industry loses a stanch advocate. Among other things, he was the "quicksilver magnate" of this coast, controlling as be did the product of the principal mines. He was of the old firm of Bolton, Barron & Co., afterward Barron & Co. With Ralston and others they were founders of the old bank of California, original owners of the New Almaden quicksilver mine and incorporators of many other great enterprises. The firm itself was agent for Anthony Gibbs & Co. of London, for the New Almaden and other quicksilver mines and for silver and quartz mines in Mexico and many of the western States and Territories. Bell himself made an enormous amount of money, and ventured and lost a great deal. He built the railroad from San Jose de Guatemala to Guatemala City, wss one of the original incorporators of the California & Oregon railway, and owned large blocks of stock in the Triumpho mine, near San Blas, Mexico, the New Idria quicksilver mine, and in various mines in tbe Tuscarora and other districts in Nevada and California. He kept stock in many of these companies in late years counting among the most valuahle the quicksilver mines and the properties of the North Bloomfield Gravel Mining Company. Recently, with Mills and Randol, Bell bought the Standard mine in Lake county, and since then practically all the quicksilver produced on this coast has been handled through Tbomas Bell & Co. Mr. Bell was largely interested in several hydraulic mines in this State, and during his many years residence here has invested heavily in mining property in this and adjoining States.

Judge Gilhert of the U. S. Circuit Court granted an injunction against Chas. H. Laurence and others, to restrain them from operating a hydraulic mine. The mining debris from the defendants' mines escapes through a shaft 90 feet deep sunk in the lower level of the mine; thence it is discharged into a tunnel 3000 feet long, which empties into Canyon creek. Ahout a quarter of a mile below the exit of the tunnel a dam has been constructed across the channel of the creek. It is a crib dam of heavy fir logs pinned together at the corners and raised to the height of 28 or 30 feet. The interior of the crib is filled with stones. The current in the dam is sluggish. The width of the impounding pool is from 125 to 200 feet. The dam, though strong and well-huilt and capahle of sustsining great pressure, is of wood, and stands in the bed of a "torrential stream," and is, therefore, liable to be carried away by freshets. The debris impounded above the dam would by the same destructive forces be carried into the streams below. Canyon creek empties into the north fork of the Yuba river, about a mile helow the dam. The north fork of the Yuba discharges into the main Yuba; tbence into tbe Feather river; thence into tbe Sacramento. The impounding reservoir is not full, but its capacity, while considerably reduced at present, may be increased by raising the dam to a height of 100 feet or more. "It is evident," says the judge, "tbat with the increased height of a dam a corresponding increase in length must be made, thereby entailing a corresponding increase of tbe danger of its breaking. In view of the principles announced in the decision of this court in the mining debris cases in 1884 (9 Sawyer, 441), and in view of the justly grounded apprehension of injury to navigation in the case of any wooden dam constructed across the channel of a mountain stream, as in the case now before the court, I am of the opinion that an injunction should issue, as prayed for in the bill." Our antidebris friends take comfort to themselves from this decision, because the injunction was granted. It will be noted, however, that the main point is with relation to the wooden or log dam across a "torrential stream." Now the U. S. Engineers, in their report to Congress, recommend masonry dams to restrain the debris. These would be upon both torrential and navigable streams, or rather, above the latter. But the masonry dams are not to he built of cut and faced stones, but simply of rocks thrown across the stream. It is not desired to make them water-tight; hut simply to hold back the debris. This decision is not against dams in torrential streams, hut against timber dams in torrential streams. Had the dam been huilt of stone, as the engineers recommend, it is highly probable the decision would bave been different.

The Consolidated California and Virginia Mine.

The annual election of this mining company was held October 17th. The usual stereotyped form was changed somewhat through the introduction by the Mining Stock Association of the following demand and protest:—

We, the undersigned stockholders in the Con. Cal. and Virginia mine enter the following protest:—

The evidence in the suit of Fox vs. the Hale & Norcross Mining Co. disclosed to shareholders in the Comstock mines some of the reasons for the failure of dividends, and the constant heavy assessments of the stock. The line of methods by which thousands of dollars were fraudently appropriated by the millowners who milled the ores of the Hale & Norcross mioe have been adopted and successfully used by other milling companies on the Comstock.

We are now prepared to state to the stockholders of the Con. Cal. & Virginia that we have been plundered by the same system or methods, and property of the mining company to the extent of thousands of dollars has been unlawfully appropriated by the Comstock M. & M. Co. the corporation which has been milling the ores of the company for years. The contract with that milling company makes no provision for the protection of the property of the mining company hut under its terms the valuable ores of the mine are delivered into possession of the milling company to he by it milled without checks or guarantees of any character.

No percentage of the value of the ores as they are assayed at the mine is exacted, and the milling company is permitted and entrusted with the duty of ascertaining the value of the ores as they are worked at the mill and this valuation is accepted hy the officers of the mining company without question. Under this system the Comstock M. & M. Co. has been enahled to extract from the ores of the mining company vast amounts of hullion worth thousands of dollars and has thus unlawfully appropriated the same to its own use. Such a loose and unhusiness-like system would not be permitted by directors of a mining company not under the control of the milling company and we charge that the directors of the Con. Cal. & Virginia Co. are now and for many years have been under the absolute control and direction of the owners of the Comstock Milling Co. and through a shrewd and cunning manipulation have declared small dividends at long intervals and levy no assessments. Of the business of the mining company the stockholders have been falsely led into the belief that its affairs have been honestly and carefully managed.

The incident of three "astray" bars of hullion is hut an illustration of the facts and methods above alluded to.

We are prepared to furnish to the directors of this company a list of a great many hars of hullion of great value which has been claimed and appropriated by the Comstock Mill and Mining Company out of the ores of the Con Cal. & Virginia Co.

The directors to he elected should he instructed to suspend the further milling of ores under the unlawful contracts now existing between it and the Comstock Mill and Mining Co. and that a new contract he made making provision for the honest working of said ore.

The directors should he further instructed to make efforts to obtain a reduction in charges for milling, transportation, water and lumber which are exorhitant and unfair.

We charge that the Consolidated California aud Virginia mine is not managed in the interest of the shareholders of the company, hut in the interest of and for the profit of the Comstock Milling Co. In proof of this we submit the following figures:

Ore extracted from the mine from August 1, 1891, to August 1, 1892, 54,898 tons.

According to the pulp assay publicly given hy the company, this ore was worth an average of $23.37 per ton, or a total value of $1,282,767.08

The Comstock Mill Co. returned of this pulp assay in hullion $987,624, retaining in tailings $295,143. It received for milling 54,898 toos of ore at $5 gold per ton, $323,388, equal in hullion to $375,515.32, this making their receipts $670,645.32 hullion value, out of $1,282 767.08 worth of ore, or more than one-half of the pulp assay of the ore.

The company commenced the fiscal year with $98,374.94 in the Nevada Bank. It has crushed over 55,000 tons of ore worth nearly $25 per ton, and at the end of the fiscal year the company is reported in debt. Is this working the mine in the interest of the shareholders or in the interest of the mills?

We Demand:—1st: That the directors of this company take immediate steps to recover all hullion or its value unlawfully appropriated hy the Comstock Mill and Mining Co. out of the ores of the Consolidated California and Virginia Co. and we will furnish them a full list of all such fraudulently approoriated hullion.

2d: We further demand that the Board of Directors of this company instruct the superintendent of the mine to stop shipping ore to the mills owned or controlled hy the Comstock Mill and Mining Co.

* * * *

MINING STOCK ASSOCIATION, per
J. H. TINGMAN, Secretary.

The offer of the Mining Stock Association to furnish a list of the bullion claimed by them to have been fraudulently appropriated is certainly very suggestive, and as they have in the past always carried out any proposition they have made, it is absolutely the duty of the directors of the company, acting for the shareholders whom they represent, to take advantage of the proposition and regain this bullion for the use and benefit of the shareholders in the company. The voting for directors was very suggestive. What is recognized as the "mill ring" people voted 195,449 shares hy proxy and 36 shares of stock. The brokers, as usual, stood in with the mills and against their own customers. Of the proxies voted there were given by the

	Shares.
Anglo-Cal. Bank	3,781
Bank of California	15,475
Nevada Bank	23,482
Wells-Fargo Bank	9,766
H. B. Parsons	3 568
W. H. Oliver	4,828
	60 840
Proxy from Secretary	12,508
Proxies from Brokers	122,101
	195,449

The same old board of directors was elected and presumably will continue to run the mine in the usual way—a way which seems to benefit the millowners rather than the stockholders in the mine itself.

According to their own statements they commenced the year with cash in the Nevada Bank, $98,374.94. The mine produced during the year, in round numbers, $974,341.89. The indebtedness on Oct. 17, 1892, was $11,541.57. They received $1,084,258.40 during the year and out of this huge amount the mill company got about $500,000; while the shareholders got nothing.

The ore during the year averaged between $23 and $25 per ton, and the company is brought in debt. John W. Mackay in the Hale & Norcross case testified that $14 ore would pay a profit to the mine, and yet here is a mine partly under his management which loses money on $23 ore.

The stockbolders of Con. Cal. and Virginia owe it to themselves to see that the directors take immediate steps to recover the bullion reported as taken from the company, and to see that no more ore is sent to the mills owned by the people who have made such a record with them as was shown in the Hale & Norcross decision.

Another point to be considered is whether the banks which give proxies are not liable for loss brought upon the owner of the shares for which these proxies are given. If they help to elect "dummy" directors, who by their passiveness permit the property in their charge to be robbed, why should not the banks stand their share of their "illegal acts."

The whole business, as at present conducted, seems "rotten," and the people who own the shares are apparently looked upon as fair game. If they would let the shares of stock alone and compel the manipulators to hear the brunt of assessments there would soon be a change. As long as the people buy them, so long will they be robbed.

THE annual meeting of the stockholders of the Consolidated California and Virginia Mining Company was held on Monday. The old directors and officers were re-elected as follows: Charles H. Fish, George R. Wells, C. O'Connor, W. S. Lyle and H. B. Havens; Charles H.

Fish, president; George R. Wells, vice-president; A. W. Havens, secretary, and D. B. Lyman, superintendent. The financial showing of the company is not a favorable one, and unless some new and rich development of ore can be made during the incoming year assessments upon the stockholders are likely to be levied. The company had an indebtedness on October 1, 1892, of $11,541.57 according to the secretary's report against a cash balance on hand one year ago of 98,374 94, showing that during the year the company lost about $109,000 over and above its net earnings.

Foundry Notes.

The Pelton Water-Wheel Co., of this city, has been awarded the contract for the wheels and pipe-line for the new Morning mill now under construction at Mullan, Idaho. The pipe-line consists of 2850 feet of 10-inch and 500 feet each of 11 and 13 inch pipe. The concentrators are to be run with two 6-foot wheels working independently and a 3-foot wheel furnishes power for the rockbreakers. All of the wheels are to run under a vertical head of 900 feet. The Gates crushers have been adopted by the Morning mine for this new mill, which are also furnished by the Pelton Water-Wheel Co. These consist of two No. 3—each having capacity of 20 tons per hour. These crushers have been adopted by the Bunker Hill & Sullivan Co., who give an excellent account of their operation.

Preparations for the launch of cruiser No. 6, or the Olympia, as her proper name will be, progress at the Union Iron Works. The launch will occur on Saturday, November 5th. A dredger has been put to work to deepen the channel, and will continue to be employed until a sufficient depth of water is reached to overcome any possible danger. A new method will be employed in launching the Olympia. Instead of an electric button, as was used in starting the Monterey, only a string will be used, which will connect directly with the last blocks. A stroke of an ax will sever this string and cause the blocks to fall, when the cruiser will slide into the water.

The Union Iron Works are building some machinery for the Tepezala copper mine, which is about six miles from Rincon de Romas, on the Mexican Central R. R., on the estate of Agua Caliente. The Union Works furnished them last February with a hoisting engine, boiler and pump. Since that time the owners of the mine have ordered another hoist of greater capacity, with a larger pump, boiler, etc, to be put on a shaft adjoining the present mine. It is on another mine belonging to the same company. They have one shaft 350 feet deep and the one on which they are now sinking is 250 feet deep. It is the intention to continue this down much deeper. The new machinery is capable of doing this work to 800 or 1000 feet.

Work is quite dull at the Pacific Rolling Mills just at present. Generally the mills employ about 1000 men but now only about 600 are at work. There are a good many idle mechanics over at the Potrero, as both the large shops there are running short-handed.

Mechanical-Drawing.

"Mechanical-Drawing" is the title of a new work by John Wiley & Sons, which Osborn & Alexander, of this city, have on sale. It is a book of progressive exercises and practical hints for the use of all who wish to acquire the art of mechanical-drawing, with or without the aid of an instructor. It is written by Chas. W. MacCord, professor of mechanical-drawing in the Stevens' Institute of Technology, and who was formerly chief draughtsman for Capt. John Ericson. The exercises in part one embrace the essential features of a course of instruction which has been successfully pursued for 20 years. Those in the first two chapters are intended not only to train the eye and hand for the use of instruments, but also to form the habit of exercising freethought, judgment and taste in relation to the important matter of arrangement. Reasonable skill in execution having been acquired, the next step is to the delineation of solid objects. And in the treatment of projections the aim is to lead the student to draw these in a matter-of-fact way, as they would appear from different points of view; the express design being to keep out of sight as far as possible the artificial and often useless stage machinery of descriptive geometry. The division of subjects is: Elementary exercises; straight lines and circles; drawing noncircular curves; principles of projection; objects in inclined positions; of the helix and its application in the drawing of screws; intersections and development of surfaces; isometrical drawings, cavalier projections and pseudo-perspective; spur-wheel and bevel-wheel in inclined positions; construction of close-fitting worm and wheel; screw-propellor; standard sectionery, etc. The second part of the book is devoted to "Practical Hints for Draughtsmen," the leading object of which is to explain various modes of representation which are in many cases better than the precise ones of projection, for mechanical-drawings often convey false impressions by too close adherence to the truth and become obscure by being too exact. A chapter on drawing instruments is also given. The book, which costs $4, is freely illustrated and handsomely printed and bound. It is a valuable treatise for draughtsmen, embracing, as it does, so large an amount of practical information.

Coast Industrial Notes.

A FOUNDATION is being excavated for at the Kennedy mine, Amador Co., for Superintendent Park's new residence, which is to be a two-story structure. It is to be lighted throughout by electricity.

THE electric-power plant of the Standard Mining Company, at Bodie, is being pushed ahead rapidly. The poles are all in place and appear to be in a dead air line from the dynamo to the mill, a distance of about 12 miles.

CAPTAIN TURNER, the Benicia ship-builder, has launched the largest vessel ever built at his yards. Her deck line is 165 feet, beam 36 feet 6 inches and 16 feet depth of hold. She has a tonnage of 500 tons. She was built for Matthew Turner and others of San Francisco, and her rig will be that of a brigantine.

THE Oceanic on her last voyage to this port from Japan and China brought one of the most valuable cargoes ever brought into port from China or elsewhere, being worth over $3 000,000. Her silk alone was worth $2,500,000, there being 2900 bales. There was also a large consignment of tea on board.

THE Pacific Mail Steamship Company's steamer Peru, which sailed on Saturday for the Orient, carried what is perhaps the largest shipment of treasure which ever left here. In Mexican dollars she took $925,197, in gold coin $14,880, in gold dust $140 and in silver bullion $118,640, making a total of $1,058,857, of which $976,357 went to China.

THE Santa Cruz *Sentinel* says: The bitumen business is very good at present. It is probable that the bitumen plant at Salt Lake will be moved as the freight rate is too high, being $8 a ton from here to that city. Up to the present, 10,000 tons of bitumen have been used in the Mormon capital. The Bitumen Co. is willing to pay $7 a ton, which is all that the traffic will bear.

THE Santa Cruz county lumber market is dull just now, being overstocked. Mr. A. C. Bassett says that it is doubtful whether the Loma Prieta mill will run next year. The company will decide within the next two weeks. They are operating the Ramsey mill, near Corralitos, which will cut 8,000,000 feet next year. When the mill closes down next year it will have cut most of the timber between Hihn's mill and Corralitos.

AT the meeting of the Board of Supervisors of Alameda Co. Monday, bids were received for two new bridges over the San Lorenzo creek, to be built at once. Cotton Brothers were awarded the contract for the bridge over the creek on the road from Haywards to Crow canyon for $4385. The second contract for a bridge over the creek on the road from Haywards to Castro valley was also granted to Cotton Brothers for $3000.

THE works of the South San Francisco Land and Improvement Company at Baden are approaching completion so rapidly that it has been decided to dedicate them on the 25th of next month. The main buildings are already roofed and a new ferry-slip has just been completed. All the grading on the streets has been finished, and the contractor and all his men have been withdrawn. The laying of the tracks from the junction at Twelve-mile house to Magnolia avenue is nearly completed.

THE Giant Powder Company, which has transferred its works to Sobrante since the explosion at Berkeley, will be ready to resume the making of powder by December 1st. Three hundred men have been at work in the construction of the necessary buildings since the middle of July. The new works are located a mile from the station, or ten miles north of Berkeley, making a distance of twenty miles from San Francisco. Since the construction of the works began the little station of Sobrante has been changed in name to "Giant."

AN onyx ledge near Mount St. Helen's, Washington, was recently discovered accidentally by a horse knocking off a piece where it protruded through a trail that has been traveled from the time of the earliest settlement of the valley. It has been prospected far enough to show that it is valuable, one ledge being nearly 30 inches thick and very prettily veined. Samples have been sent to New York and Philadelphia and the replies returned are to the effect that it is worth from $4 to $20 per cubic foot, provided it can be got out in blocks at least 8x12 inches square.

THE Eldorado Milling Company now have their mill in full operation and are turning out a fine article of flour. About two weeks ago they made their first run, and milled several tons of flour, but owing to the break in the ditch, and the shortage of water they were compelled to shut down temporarily. Now, however, the mill is in full operation, with the granary filled with No. 1 wheat, all the machinery working perfectly and a fine stock of flour to denote the successful outcome of the enterprise built up by the determined efforts of a few of the enterprising citizens of the county.

SOME of the Chinese miners on the flat have struck one or two rich finds in operating the mines they have opened there recently, says the Folsom *Telegraph*. Nearly all the old mining ground around here still contains places where gold is plentiful, and many a small fortune has been dug from an abandoned mining claim by Chinese. How many fortunes will never be known, for the Chinese keep such things to themselves always. When a white man makes a big find he tells about it and changes his mode of living, so that it is easy to surmise that he has made a good clean-up, or found a big pocketful of the yellow dust, but the Chinese never do.

E. H. HANSON, of the firm of Wright, Hanson & Co. of this city, has purchased the bark Gay Head in New York, and the vessel is now en route from New Bedford to Patagonia. The idea is to revive the almost extinct industry of South Sea whaling. Nowadays a few vessels of the whaling fleet make a trip as far south as the western coast of Patagonia, but the systematic pursuit of the whale in the South Pacific and South Atlantic has been abandoned for a number of years. As a result, the species has increased rapidly in Antarctic waters, while the hyperborean ocean has been almost depopulated. The Gay Head will call at St. Helena, and will be fitted out for a three years' cruise.

ANOTHER 100 tons of steel rails for the Coos Bay & Roseburg railroad were loaded on the steamer Emily at Mission pier 1 on Tuesday. This is the second installment of 400 tons purchased in this city for the railroad. When the Emily landed the first lot at Marshfield, over 100 men were at work building the railroad, which is being pushed along as fast as possible. There are ten miles of track to be ballasted and the balance of the track laid to Coquille City of 12 miles, which will make 22 miles from that city to Marshfield which will be completed this fall. The trestle 1900 feet across Chinacamp creek, or marsh, is being pushed along with energy. Final lines are being run from Campas valley west by a large corps of engineers.

CHIEF ENGINEER ROCKWOOD, with assistant engineers and sixteen men has commenced the work of surveying the route of the Colorado canal from Castle Dome to Yuma. The canal will take water out of the Colorado river about five miles above Castle Dome, and will extend down to and across the boundary line into the Mexican territory of Sonora and Baja California. The canal will be one hundred miles long and one hundred feet wide, and will carry twelve feet of water. It has an area of excellent land, covering six and a half million acres, upon which it will carry water for irrigation. It is estimated that it will cost $10,000,000 and will take five years time to build it. The capital will be furnished by Colorado men.

FOR the last six months the Southern Pacific Railroad Company has been concentrating all of its broken-down, worn-out, superannuated engines at the yards in West Oakland. There were engines of all sorts and conditions, of every make and of various degrees of beauty. Some looked as though they were as good as any that now make regular trips. Others were ramshackle, rusty-looking affairs that seemed to have come from the bottom of the sea. In all, nearly 100 were gotten together and were placed on various sidetracks in the yards, wherever there was room and where they would be out of the way. Every one was absolutely worthless, so far as the purpose for which they were originally built was concerned. One day last week a gang of men went to work on the old engines and blew them up, one by one, with dynamite, in order to get the old iron and brass in salable shape.

A GREAT deal of work is being done by Adolph Sutro upon the baths near the Cliff House. The foundations of the baths at the base of the cliff and resting upon the beach are completed. These are to be covered with a building containing rooms and all other appurtenances of a bathhouse, to be covered with a glass roof of dome-like shape. From this level a splendid stone staircase divided into three sections will give access to a sanitarium-building, situated 60 feet above the sea-level, and of elegant design and complete furnishing. From the level of the bank to the lower bathhouse two elevators are to be constructed, the whole of which includes a structure 200 feet long and of irregular shape, to be inclosed and protected from the winds. An esplanade will crown the bluff and is to be adorned with statuary and shrubbery. Mr. Sutro also contemplates the erection of a 300-room hotel on the heights of Point Lobos. It is thought that the baths will be in operation in about four months.

Personal.

E. W. CHAPMAN, of the Taylor mine, El Dorado county, is in the city.

MR. GEORGE E. AMES, of the Union Iron Works, has just returned from a trip to Mexico.

W. F. HASSON and J. M. Thompson, mechanical and electrical engineers of this city, have been on a business trip to Grass Valley.

JOHN CURRY and Ed. Stanton, in company with Mr. Newland, are working the Van mine, El Dorado county, on shares. The mill has started up.

THE Sacramento capitalist, Morton Lindley, who recently purchased Lucky Bart's mine on the Sardine creek divide, Oregon, is working a large force on the tunnels and is putting up buildings for his men.

WM. MEIKLE, for several years superintendent of the Bald Mountain Extension mine, Sierra county, has resigned that position. There are at present but few men at work at this mine. Who is to succeed Mr. Meickle has not yet been decided, so far as we know.

ED. MERVINE and John Gibbons, two well-known miners of Mohave county, A. T., have taken a lease on the White Burro claim, in Aubrey district, owned by Harry Mehaffy, of Kingman. The claim is a silver proposition, the ore running in the neighborhood of $300 per ton.

NAVAL Constructor R. W. Steele, who has been on duty at the Union Iron Works for two years past, has been ordered to the Cramps' yard at Philadelphia. Constructor Linnard, now of Mare Island, will oversee the completion of the Monterey and such other Government work as is in hand until a new officer arrives.

W. H. WELCH, superintendent of construction for the Oregon Iron and Steel Company, has been down at San Isidro, Lower California, for the past three weeks, engaged in making a thorough inspection of the Tepustete iron mine and the other iron deposits in its immediate vicinity. He will remain a few days awaiting advices from Mr. Evans of his company, who is negotiating for the purchase of the mine, and Mr. Welch thinks it is more than likely that the transfer will be made. In that event, a force of 100 men, with suitable machinery for extracting ore, will be sent down within 60 days, and business will hum at the now sleepy old landing of San Isidro. Should the Tepustete mine not be purchased, there are other mines in the same region which possess equally as good ore and which the Oregon company may acquire.

Mines and Mining in Nevada County.

By Our Traveling Correspondent.

NEVADA CITY, Oct. 15, 1892.

TO THE EDITOR:—The mines of Nevada county generally group themselves in one of four districts, *i. e.*, Eureka, Washington, Nevada City and Grass Valley. Each district comprises a distinct mineral zone, or, more properly speaking, mineral belt, and so perhaps we should speak of the mines belonging to one of four belts rather than to a more or less arbitrarily determined district—a mere geographical convenience. Within these belts are further geological differences, as strike and dip of veins and local characteristics of country rock, that throw these mines naturally into groups. However, it is only in the Nevada City and Grass Valley belts that this grouping becomes of any considerable consequence, for there is a big difference whether such and such a mine is a continuation of the famed Idaho (and strange to say, mines half a mile either side of the axial line of this lead claim distinction as an "extension" and demand figures accordingly) or whether it is some totally distinct and, probably, cross lead.

Between the first and second of these belts there seems more or less similarity and blending of one into the other, as also is the case (though perhaps in a less degree) between the Nevada City and Grass Valley. Granite is the chief characteristic of the Eureka, as of the Nevada City belt, and syenite, chloritic schists and slate of Washington correspond in a great degree to the Grass Valley formations. But neither Nevada City nor Grass Valley have any connections with Eureka or Washington as far as mineral deposits are concerned.

There are mines, of course, outside the so called limits of these zones; but as the boundaries, as far as extension is concerned, are not fully determined, those "outside" may eventually be found to be "inside," as for example, the Delhi group at Columbia Hill, the most notable of the outside class, is maintained to be undoubtedly a continuation of Nevada City or Grass Valley, whether wisely or otherwise I have not been able to learn.

Of course, the classification here given refers alone to quartz-mining, though a somewhat similar grouping is made with gravel mines, in so far as they may be upon a certain continuous channel. But in Nevada county, with a very few worthy exceptions, gravel mining cuts but a small figure.

THE EUREKA DISTRICT.—This, as with the other districts, receives its name from the principal trade center of the belt, Eureka (South), now known as Graniteville. It is presumable that this belt is continuous with the Alleghany system of ledges in Sierra county. The mines here have not met with the generally uniform success of Nevada county operations. While there have been a few mines operated that have not proven a failure, the majority have not fulfilled the anticipations of the projectors. It has been less the fault of the mines in the cases of these failures than from the natural causes attending mining operations in all localities—lack of capital, poor or dishonest management, generally the most responsible factor, and its twin brother, litigation. Efforts are being made in many cases to resuscitate these dormant enterprises, and with considerable promise of success. It has been unfortunate for the district that there should have been so many undertakings that made no return to the original investors. There are just three claims operating in the district with anything like pretension, and compared with other quartz operations of the county, they seem insignificant. But the largest mines have often had a small beginning, and to this district the success of these three mines is significant.

ROCKY GLEN, owned and superintended by C. D. Easton, was purchased two years ago from Hayward & Co., who never thoroughly opened it up. The ledge, on the contact of slate and granite, averages eight feet in width and is low grade milling. It has a 10-stamp mill, water-power. Work at present is going on in the south drift, 150 feet, and indications are favorable for its proving a very rich and valuable property.

THE CALIFORNIA.—This has a 10 stamp mill also, and is one of the mines that has yielded well, but has been poorly managed in the past. At present, it is under the superintendence of P. Foley, and has been making a good showing, when working the past season, on $10 rock. On the 300-foot level, a tunnel is being driven ahead now to strike the north chute. Ore can then be transported direct to the mill, as now it is necessary to tramway 1000 feet and send it down in a chute, thus saving considerable time and labor.

THE NATIONAL MINE.—This is two miles below Graniteville and is owned by the estate of the late D. R. McKilliken, the man who did more for northern Nevada county mining interests than any one else. Mr. Fred Brown is superintendent, but during his continued absence, an account of ill health, Mr. Dan Powers has charge. The mine is developed by a tunnel, 220 feet in length, on the ledge which has been stoped above. From the end of the tunnel a shaft was then sunk 100 feet. Very recently a large chute of rich ore has been struck, showing a good, continuous, seven-foot vein. This has given splendid and well-deserved encouragement. A five-foot Huntington centrifugal has been doing the crushing with apparent satisfaction. On the hardrock the capacity has been about 20 tons per 24 hours. It is intended to place two more in position immediately. The efficiency of the mill has been greatly increased by the use of the Gates rockcrusher, which pulverizes the rock to any desired degree of fineness, generally the size of a pea, before it enters the mill. It thus saves an immense amount of pounding and wear on the steel rings and dies. The adaptability and advantages of the Gates breaker for all kinds of milling seem obvious, and it is surprising there are not more of them in use. At the National, one of the smaller sizes is used, but it can keep three men busy feeding it, crushing very rapidly and readily taking the largest-sized rocks into its voracious and insatiable maw. In strength and length of wear, it is said not to be lacking. The Taylor mine, 20 stamps and 20 more now adding, El Dorado county, is introducing one of the largest sized. These two are the only ones I have met with.

The water in this mine is taken up by a hydraulic ejector, the invention of Mr. C. T. Rouner, the engineer. It is similar in principle to the ejector or elevator used in river gravel mines, but is made adaptable to shaft-pumping by the introduction of a safety valve in the suction pipe, so that in case clogging of the escape-pipe occurs, the water brought in to furnish power cannot flow back and fill the mine. In shallow workings, it has been used with great success in various portions of the county, Mr. Rouner never having attempted to protect his invention by patent.

These three mines, as before stated, represent the active milling operations of the district. A brief synopsis might be appended of other mines in this belt having milling plants, some of which are for sale, and offer some good chances for the introduction and intelligent use of capital and labor.

NORWAY—First, in the southern extremity and adjoining the Washington district is the Norway 5-stamp mill, water power, idle for past 8 years; for sale, rock said to be hard and ledge small.

RAINBOW—Fine new 20 stamp steam mill; worked intermittently for some time; property of Messrs. Mead and McBean.

THE BALTIC—Fine 20-stamp steam mill, also in the control of Mead and McBean. This was built and the mine just opened by Harvey S. Brown, of San Francisco, who proved the dupe of a dishonest management. The mine has been closed down for two years, but work is now going on preparatory to an early resumption of operations.

THE BOSTON—Owned by Fernback & Co., of San Francisco; splendid new 10 stamp steel mill, water power; idle for nearly two years. Immense sums were spent on an expensive plant and then found there was no mine. The mill is for sale.

THE GAMBRINUS—Is an extension of the California; 10-stamps, steel, 1000 pounds each, water power. While the mill has been idle for the past year or so, Mead and McBean, the owners, have been quietly prospecting the ledge with encouraging results.

THE IXL—Is idle on account of muddled ownership. Eight-stamps, water power free; a large low-grade milling ledge.

THE DUBLIN BAY—Has a 10-stamp mill; is at present bonded to H. C. Callahan of the Eaglebird.

BIRCHVILLE—The 10-stamp mill has been idle for the past 16 years. There is some intention of opening up the old works which have fallen into a dangerous condition. This is owned by Messrs. Parsons and Maybanks of Graniteville.

THE GOLD CANYON mine and five-stamp mill on the Middle Yuba is the property of Mrs. McKilliken, of the National mine. A great deal of money was spent in developments, but with the death of Mr. McKilliken they ceased. The property could doubtless be purchased at a reasonable figure.

THE WASHINGTON DISTRICT—Operations here have a more substantial appearance, as the mines that are now busy have continued active for many years, have plenty of capital behind them, good rock ahead and are ably managed—the main feature in mining after all. This zone comprises a number of ledges, generally striking southeasterly and northwesterly, and supposably connects with the Sierra Buttes system. The east wall of the zone is of granite and the west of slate, while the character of its lode material is generally chloritic schist, which, in turn, in most cases forms the walls of the ledges.

THE EAGLEBIRD—While generally known by this name, it is properly the Diamond Creek Consolidated Gold and Silver Mining Co. Mr. H. C. Callahan is superintendent, a successful operator, a man of scientific attainments and withal a capital host. This mine is near the east granite. The 30-stamp mill has run continuously for many years. The ledge is from 5 to 20 feet in width and the ore is low grade and generally free-milling. Some sulphurets are caught on canvas tables, and shipped to Salt Lake City. These concentrates average about $100, but form only about one-half of one per cent of the ore. The mine is developed by a shaft 700 feet on the ledge, and seven levels besides two upper tunnels running nearly one thousand feet into the mountain. Work is going on in all of the levels except the bottom. The mill and mine are lighted throughout by electricity.

THE YUBA MINE—This is a mile west of the Eaglebird and likewise situated on the south bank of the South Yuba. Mr. George A. Hare is superintendent, a compeer of Mr. Callahan. Messrs. Haggin and Webber, of San Francisco, are the principal owners in the mine, which has worked steadily for the past 25 years. Twenty 900-pound stamps crush about two and a half tons each of hard rock per 24 hours. At the end of a 550 foot tunnel a shaft is sunk 800 feet. From the bottom of this the ledge is worked 700 feet, the stoping for the past year having been confined between the 600 and 800 foot levels. The rock now milling is of medium quality.

GERMAN MINING AND MILLING CO.—This is one of the new enterprises of the county, and is one of the very promising ones too, and of the kind it might well be wished there were more. M. D. Cooley is manager and superintendent of the company, which but recently organized in Rochester, N. Y., and under the laws of West Virginia. For the past two years Mr. Cooley has been quietly developing the mine, which is now sufficiently opened up to warrant the building of a plant. Arrangements are nearly completed for the receiving of a 10 stamp mill, which will be running by next season. It has been necessary to build a considerable stretch of road and a 220 foot bridge across the Yuba, which means a large expenditure of money. The company has recently secured a valuable water-right on the north side of the Yuba which gives 300 feet of pressure.

THE SPANISH MINE.—Mr. David Johnson is superintendent of this mine, which is situated three miles north of Washington. The Spanish is a peculiarity in quartz mining. It has none of the ordinary characteristics, as of a narrow ledge between well-defined walls, worked by incline, etc. The ledge is of soft, decomposed material, varying in width from 50 to 100 feet, all more or less gold-bearing and paying to mill. Consequently the mine is an open cut, with walls of 100 feet or more in height and the width of the lode. The mine is also developed by tunnels, through which work has to be prosecuted in the winter time. Seventy feet below the cut is a tunnel, 500 feet in length, and 200 feet lower still they are running another tunnel, which will eventually be the main operating channel. Preparations are being made for the erection of a 10-stamp mill at the mouth of this tunnel. The mill now on the adjoining (Santa Anita) claim will be removed for this purpose. Likely the Huntington mills will also be transferred here from their present position. Three Huntington's, two of five feet diameter and one of four, do the crushing at present and seem exceedingly well adapted to this soft material. The three have a capacity of about 70 tons a day. The most remarkable feature of this mine is the extremely low grade of the ore. It seldom averages over 80 cents a ton, yet the mine continues to pay its owner well, and a dividend was paid at one time on a 30-days' run of 65-cent rock. The average cost of mining and milling is as low as 50 cents a ton. The main reason why rock of so low a grade can be milled at any possible profit is owing to the manner in which the mine is worked, necessitating the least possible amount of timbering.

A short distance west of the Spanish is the Greystone, a mine similar in character, with parallel ledge. It has also an open cut, which has been washed, and a tunnel 120 feet, from which an incline has been run a short distance. Messrs. Dillon, Snell & Nilon are operating it and intend putting up a centrifugal mill in the spring.

THE WASHINGTON MINE.—This adjoins the German mine on the west. It has a 20-stamp mill, but for the past year both mill and mine have been idle. It is stated that the return of the owner, Baron von Shroeder, from Europe will likely see the resumption of operations. Alf. Tregidgo, the proprietor of the great electric-power scheme of Grass Valley, is superintendent. Without irrelevance it might be added, he is one of the kings of hosts in the row with Callahan and Hare.

THE BLUE JAY, owned by the Eaglebird Co., is opposite the Yuba mine and on the divide of the Yuba river and Canyon creek. It is developed by a tunnel 220 feet north of the vein, disclosing a chute of ore from one to five feet in width and 100 feet long, and milling $15 at the Yuba mine, where the rock is crushed by custom. From the end of the tunnel a winze is sinking 100 feet, whence 100 feet further will be run on the vein. A mill will probably be erected within the next year.

Another new enterprise is broached in this same locality. It is expected that a Salt Lake company will put up a mill soon on the ledge known as the Fritz Meister claim at the mouth of Canyon creek, as they have secured control of considerable mining property in that section lately.

Mr. Henry Kohler of Washington has a couple of prospect mines of merit on the Canyon creek divide known as the Nevada City and Cosmopolitan, and said to be extensions of the Eaglebird. They are each opened by about 200 feet of tunnel. Much of the ore extracted has milled high-grade. These are a few of many creditable openings for the entry of outside capital.

In the North Bloomfield gravel range little is doing outside the Derbec mine and a few small properties at Relief Hill. As all know, here was the greatest hydraulicking operation in the State—the Malakoff or North Bloomfield mine. While there is a range of gravel 14 miles or so in length passing through this section, and available only with the hydraulic process, the probability of its being worked again in that manner is remote, not but that many properties should be allowed to be worked. Prejudice, however, is so strongly intrenched against the great mines here, at French Corral and at Smartsville, that restrictions under which they may be permitted to run are likely to prove prohibitive to both big and small mines in this vicinity. It is not the small hydraulic claim that has caused the trouble in the past, and it is still more unlikely to be of injury in the future, for the lesser properties are easily capable of restraining and holding within proper bounds their own tailings. Future legislation should look particularly toward affording relief to the numerous and far more deserving class of small hydraulickers.

DERBEC GRAVEL MINE.—This is and has always been the leading drift mine of this section. Theodore Wetzel, the superintendent, was conservative in his statements regarding the present developments going on in the mine. The work of opening up new ground has called for assessments, but prospects look favorable to an early resumption of dividends. For the past two years, drawing the pillars has continued. From the bottom of the shaft, which is 470 feet deep to the bedrock, a 400-foot drift is being driven, which is expected to strike the back channel.

AT RELIEF HILL, four miles east of North Bloomfield, less is doing than the possibilities of the place naturally demand, as the operators are generally poor men, heretofore unable to open the ground properly. The principal property is the Union mine of C. O. Jepson. The mine is opened up by about 2000 feet of tunnel into the channel, is working about 20 men, and reported paying well. East of this is the echo, as yet undeveloped, and owned by Messrs. O'Connor and Morrison. The Waukesha of W. O. Williams is a promising property. It has a 1500-foot tunnel. New machinery has lately been purchased, and it is intended to put on 25 or 30 men at once.

THE DELHI MINE is situated at Columbia Hill on the banks of the middle Yuba. Mr. Robt. McMurray of San Francisco is the owner; Chris Malon is superintendent. The upper levels being exhausted, work is now going on in No. 4, where a point but 80 feet from the river has been reached. In consequence, an immense body of water, amounting to 50 inches, is pouring into the mine, which is a source of inconvenience. A hydraulic pump, similar to

that used in the National mine, is here in use. Within a very few weeks a rich strike has been made, which will probably warrant the introduction of new and heavier pumping machinery, etc. The 18-stamp mill is kept generally busy. The ore is mostly free-milling, though the company has eight concentrators and its own reduction works. One thousand feet west the same company is developing a parallel ledge. There are several good prospect mines in the immediate vicinity, as the St. Gothard, owned by the Nevada City Champion Co. It has steam-hoisting works and a shaft to some depth. The Grizzly is another. Just across the river is the King Solomon, owned by a Grass Valley company, which is preparing for the erection of a ten-stamp mill. I will send you further notes next week.

CHAS. E. TOWNSEND.

The Gustin Belt.

SAN FRANCISCO, Oct. 15, 1892.

TO THE EDITOR:—In an article written a short time since for the MINING AND SCIENTIFIC PRESS, entitled "The Age of Gold," I referred to the Gustin belt as a placer mine which was formed at a very early geological age, and in the article referred to promised to write something more concerning this interesting deposit.

The name "Gustin belt" is applied to an extensive conglomerate bed found in the Black Hills of south Dakota, and is confined to that portion of the deposit occurring in the northern part of the Black Hills, and particularly to that portion which lies to the northeastward of the famous Homestake mines, and is still further limited to that portion which is gold-bearing and that has returned large amounts of gold in the process of mining.

The nucleus of the Black Hills consists of a broad series of mica schists, quartzites and other metamorphic rocks of archæan time, uplifted at a high angle usually, with a prevailing dip to the northeastward. Local exceptions occur, and in the western hills, in a comparatively limited area, the rocks dip slightly to the westward. The strike of these rocks is generally northwesterly and southeasterly.

That these highly altered strata were formed from preexisting rocks there can be little doubt. Many of the quartzites and micaceous sandstones still show that they are of fragmental origin. There has been an almost universal opinion that the archæan terrane in the Hills was exposed without a fold for 25 miles across the uplift, representing consequently this immense thickness of formation. This, however, is not the case, as there is clear evidence of folding in the argillites on Rapid creek, a few miles above the town of Pactola.

In Cambrian time certain portions of the archæan rocks were standing above the surface of the ocean that surrounded them, either as a single island or several of them, forming a group. The crystalline rocks were disintegrated and the detritus carried down into the ocean. In many parts of the Hills the ancient shore-lines are remarkably distinct, being marked by extensive deposits of conglomerate made up of the bowlders, pebbles, sand and mud derived from the wasting and tearing down of the archæan formation.

This conglomerate, together with thousands of feet of younger strata, has been eroded over large areas, and the numerous exposures or outcrops are not found in a continuous bed, though there is no question but that they once formed an unbroken bed over large tracts. In two places in the Hills the conglomerate is gold-bearing—one at Rockerville, in Pennington county, and the other in the Homestake region. There may be other occurrences of gold-bearing "cement" in that county, but I am not familiar with them. It is of the Gustin belt I will speak more particularly.

Commencing in a region about three miles northwest of the city of Deadwood, on a tributary of Polo creek, the cambreo-silurian conglomerate is exposed by the erosion of the canyons. It lies unconformably on the upturned archæan and is covered conformably by a thick bed of dense quartzite which has mostly undergone recrystallization. Above this are found a succession of shales, sandstones, impure limestone and sheets of intrusive rhyolite. This portion of the Hills is greatly disturbed by local uplift and the faulting and folding of the strata, caused, no doubt, by the intrusion of the eruptive rocks.

The conglomerate at the point referred to is about five miles distant, perhaps a little more from the nearest portion of the Homestake belt, but gold is found in the conglomerate, and a recent placer has formed in the canyons which have cut down through the conglomerate. The economic results of operations I believe have not been satisfactory.

Coming southeasterly toward the Homestake, the conglomerate bed is found at intervals in the immediate neighborhood, but in the vicinity of City Creek it is lost, great masses of porphyry constituting the entire formation. Whether it has been uplifted and eroded or whether the conglomerate still lies beneath the eruptive rocks, I am unable at present to say. In Blacktail gulch, however, it reappears in the Gustin, Bessie, Esmeralda and other mines, cropping along both sides of the canyon. Here the deposit has been worked extensively and is reputed to have produced over $2,000,000.

The placer mines in the gulch below all paid handsomely, as they did in all other gulches in the vicinity where the conglomerate has been eroded.

Continuing southerly, we find the Wooley, Pecacho, Hidden Treasure, Keats and Aurora mines between Blacktail and Deadwood gulches and the Alpha, Great Eastern and one or two others on the south side of Deadwood gulch, near the Deadwood and De Smet mines. All of these mines were rich and where managed properly returned handsome profits to their owners.

Farther to the eastward the High Lode, Queen of the Hills and some other claims are located near the Caledonia mine, now one of the Homestake group and also in archæan rock.

It must be understood that broad canyons have been cut down through the conglomerate and far into the archæan in many places, resulting in separating this once continuous belt into segregated areas half a mile or more apart.

Crossing the broad belt of gold-bearing chloritic schists and quartz constituting the Homestake belt to the southward, the conglomerate is again found in the Durango mine, and only 600 or 700 feet from the Homestake mine, but though identical in every particular lithologically with the mines of the cement belt north of the Homestake, the Durango, the nearest claim to the great mine, has never paid.

The conglomerate extends for miles to the southward, far beyond the Homestake, and finally passes out of sight beneath the later formations on its dip to the southeastward.

The only conclusion, in view of these facts, is that the Gustin belt has derived its gold, in great part, directly from the Homestake group of mines; that the currents or waves came from the southward and in time covered the source of the gold, the sea retreating evidently to the southeast as the conglomerate shore-line formed. The deposit appears to me to possess all the characteristics of those formed on rocky shores of the oceans of to-day, and not to have resulted from river currents as has been frequently asserted. The gold is mostly found on bedrock and in places was very rich, but it was also found scattered through the overlying material to depths varying from two to ten feet. The rock is very hard and cemented by siliceous material. It is worked in quartz mills the same as the rock from the quartz mines.

The Gustin belt forms one of the finest geological studies found in the Black Hills region, which abounds in typical geological phenomena, and its economic importance tends to give the deposit even greater interest.

On or near the South fork of Castle creek in the southern hills, this Cambrian conglomerate occurs, resting, like the Gustin belt, unconformably on the archæan rocks, but at this point it carries native copper with limonite and is extremely hard. The deposit is but two or three feet in thickness. Its lateral extent has never been proven. The overlying formation is a coarse, friable sandstone which disintegrates rapidly, giving the hill a rounded, smooth appearance. On the main Castle creek, about three or four miles above Mountain city, the deposit is from 20 to 30 feet in thickness and seems to be loose and incoherent, the only cementing material being a little infiltrated calcite.

Over broad areas the contact of the Cambrian and archæan is marked by a heavy bed of quartzite without included pebbles or bowlders, showing it to have been deposited at some distance from the shore, in deep water.

W. H. STORMS, E. M.

THE belt railroad around the water front of San Francisco is gradually being extended westward. The Harbor Commissioners have arranged for an extension from the foot of Francisco street to Powell on a single track. The contract has been let to Healey & Tippetts for $2400, the State furnishing all rails and fastenings and everything with the exception of ties. A change has been made in the construction of this part of the road by Engineer Holmes. Instead of plank crossings for the streets the rails will be laid on heavy steel chairs, which will allow the crossings to be paved or laid with hasalt blocks. A locomotive is already running over the old track, and all the freight from the North Pacific and South Pacific Coast—that is, all the terminal freight—is now handled in the yard of the belt railroad at Front street. The new Powell-street wharf is provided with track-stringers, so that at any time the road can be extended on to the wharf. In this way, lumber or other freight can be handled direct from the ship. The extension is expected to be completed within two weeks. There is only half a mile of single track and 20 men are engaged on it.

THE "Chappelet franchise" was originally intended as one for building an electric road from Haywards, Alameda Co., to San Jose, Santa Clara Co., but it could not get entrance to the latter city. The gentlemen interested are now arranging for a new combination that will result in the construction of 17 miles of road and its operation. They now hold franchises in Alameda Co. running from Haywards to Niles, and thence down to the Santa Clara line on the way to San Jose, where they proposed to end their road. They then secured a franchise down toward the bay, taking in Alvarado and cutting back toward the main line, taking in Centerville, Irvington and the Mission San Jose. It is now proposed to construct this latter line, and thus put the towns of Centerville and the Mission San Jose in direct communication with Oakland, these towns now being away from the main line of the steam roads. The holders of the franchise are looking for a bonus, however, and would put this line of road in operation for about $15,000 or $20,000, to be paid by the property-holders along the route.

THE President of the Southern Pacific has decided to at once push the work of filling the gap on the coast division between Santa Margarita and Ellwood. When completed, this will make another through line between this city and Los Angeles, via. San Jose, Castroville, San Louis Obispo, Santa Barbara and Sanger. There is some heavy tunnel work immediately south of of Santa Margarita, and that will be commenced first. The right of way given to the company after running through the mountainous country for a distance of about sixteen miles between Santa Margarita and the town of San Louis Obispo extends almost due south from the latter place, crosses the Santa Maria river in the vicinity of Canada de las Pinos Ranch, thence through the Gaviota pass, and then westerly to the shore of the ocean, a number of miles northwest of Elwood. Only a part of this route may be used, as the company has made another survey further west with the idea of avoiding the Gaviota pass and the grades through the San Rafael mountains.

The Mule.

The hybrid animal which is part horse and part ass evinces, more than any other such cross perhaps, all the distinguishing characteristics of both the parents. He has all the good qualities of the horse, some, however, being modified by the interfering tendency of those of the ass. Thus he has the strength, size and form, with much of the sagacity and docility of the dam, and the obstinacy, in good as well as bad, of the sire, with his hardiness, longevity, surefootedness, untiring patience and robust constitution. A mule is said and thought to be extremely obstinate, proverbially so; but this quality in this animal has its most useful development, for to it is due the fact that a mule never balks, but persists in pulling until he lies down for inability to use another muscle. It begins work earlier and continues longer by several years than a horse; it is rarely ever sick, and, generally, unless wofully misused, has nothing the matter with it from the time it begins to work at three years old until it is discarded at the age of 40. Mules have been known to live and work more than 40 or 50 years without any rest by summer-pasturing, but constant tugging of heavy loads on mountain-roads throughout the entire years. Their digestion is remarkably strong, and their appetite is easily satisfied. In the absence of its usual corn and blade fodder, it will most contentedly make a meal of the bark of a tree cut for the purpose on the roadside, where the driver camps at night after 25 miles of heavy pulling, with no bed but the ground and no roof but the starry infinite above. In cold and heat, rain or snow, in mud or over rocks, it wends its way without a break or an objection, and brays for its coarse fodder and eats it with excellent appetite wherever it may stop for its short rest. The mule is no racer, but it may be trained, says Henry Stewart in *American Agriculturist*, to travel under the saddle or in light harness at a very good speed, and it will maintain its pace for ten or twelve hours with more steadiness than a horse. Its compact build makes it the best pack animal. The horse is the more luxurious animal and more human in its disposition. Its nerves are more acute, it has higher instincts, and is more refined. It is kinder in disposition, and is more easily and strongly attached to its keeper and owner, who uses it kindly. It can make a more vigorous effort on the spur of the moment, but cannot maintain a slow, dogged energy like the mule. It requires more food, and that of a better quality for these reasons.

Where quick work for a short time is wanted, the horse heats the mule; but for the slow draft and unchanging toil, the mule is the more useful. A mule is kept one-half more cheaply than a horse. It may be fed on blade fodder and a few ears of corn day after day without any change, and will do more work on this coarse fare than a horse of 200 pounds more weight. This character is so well fixed that in the South, where all the hard work is done by mules, a mule of 1000 pounds is worth $100 or $150 more than a horse of the same weight, and for smaller animals the difference in value is $50 in favor of the mule. For a few years past I have been rearing young mules and horses, and while the colts get the best hay and more grain, the mules get corn fodder, the coarse hay and few corn ears. An accurate account of the cost of feeding the two kinds of animals up to three years old shows that the mule may be reared for half the cost of a horse colt. A pair of small mules cost me less than $20 a year for the two years they were fed, and they lived during the summers in a wood lot, and cost nothing for their pasture. A mule will live where a horse will starve, and, when out of work, enjoys the coarse feeding of the woods. When the horses come to the gate and wait to be brought home for their feed, the mules have to be hunted up, and bells are put on them so that they may be found. On the whole, I am very sure that a pair of mules will do twice as much work as a pair of horses the same size, or somewhat larger, at half the cost of feed and other expenses. This takes into account the feeding, the work and the longer life. Much is said about the ill-nature of a mule. This is undeserved. Its frequent viciousness is taught to it by ill-treatment and general bad management. A mule will never kick unless it has been taught, except in frolicking when young. It is really affectionate and good-natured, and when otherwise it gives only what it gets. When kindly treated from the first by those who rear it, the mule will be kind, docile and even affectionate. It will not be so demonstrative of its affection as a horse as kindly trained, but it will show its good nature in its own more sober manner. The horse is a subject for the poet, the mule for the man whose life is spent with a freight-wagon or a plow before him.

BY January 1st there will be five new electric roads in operation in Oakland, and upon all of these roads work is now being done. The Fourteenth-street electric road is completed with the exception of a little electrical work. It will be put in operation in about two weeks. Cars will run down Clay street and up Washington, and there will be no double tracks on either street. The Oakland, San Leandro and Haywards Company is pushing its line into Oakland from the present terminus at Thirteenth avenue. It has secured permission from the Piedmont Cable Company to run down Clay street. The line will be in operation by the 1st of November. E. P. Vandercook of the East Oakland electric road says that his line will be in operation by the 1st of November. The Telegraph-avenue line will be running by the 1st of January. The wires are now being strung and the cars are being sent from Newark to the carhouse at Temescal, where they are being fitted with motors. Work has been commenced in West Oakland on the line of the Consolidated Electric Company's line, down Eighth street and out Peralta street to Berkeley.

THE underground force employed in the Yellow Jacket, Crown Point and Belcher mines on the Comstock, was increased on Saturday by the addition of 100 men. The increase is due to the recent rains swelling the Carson river's flow so that the stampmills operated by it can resume crushing.

Mechanical Progress.

Electric-Light Carbons.

The French Vice-Consul at Nuremberg, M. Leon Duplessis, has recently made a lengthy report on the electric-carbon industry of that town, from which the following extracts are taken:

"The manufacture of electric-light carbons occupies six large factories, belonging respectively to C. Conradty, Ch. Shmelzer, Carl Braun, J. G. Meier, Emile Mahla, and Jules Fuchs. To these may, perhaps, be added a seventh, namely, that of Dr. Albert Lessing, though the latter does not produce carbons for electric-lighting, but only battery carbons.

"The raw material employed in this manufacture is 'retort graphite.' As far as the vice-consul was able to discover, this material only is used when homogeneous carbons are required; but when cored carbons are to be made a softer substance is added. Before they are ready for use, homogeneous carbons pass through twelve, and cored carbons through sixteen, different processes. The first operation is to break the graphite into small nuts. For this purpose a three-stamp mill is used. The stamps, in falling, crush the graphite placed over movable steel gratings that allow the broken material to pass between their bars. These bars are placed nearer to one another, or farther apart, according to the size of the pieces required. Having passed this grating the pieces are collected by hand and passed through a sieve. The coarse particles are submitted to a vertical crushing, and the fine are passed on to a rolling-mill. The vertical crushing is intended to reduce the pieces of graphite to about the size of semolina grains. The graphite thus treated is directed a second time into a sifting machine. Then follows more rolling. The sixth operation is to damp and mix the graphite obtained from the rolling-mill, as well as the powder gathered in the sifting machines, with a binding substance. The mass delivered from this machine being too soft, it is necessary to render it plastic and capable of taking a shape, and with this object it is consigned to a sort of puddling machine which produces a species of paste. This paste is pressed through a machine fitted with dies. These produce coarse rods or other pencils, according to the diameter of the cylinders. The rods so prepared are introduced into steel hydraulic cylinders and submitted to a pressure of about 25 atmospheres. Some of these hydraulic presses—the construction of which the Nuremberg manufacturers have only attained by successive steps—can deliver 500 metres of carbon per hour, or from 2000 to 3000 arc-light carbons of average size. All these operations terminated, the carbons obtained are baked in a blast furnace where the temperature occasionally attains as much as 2000° centigrade. When homogeneous carbons are withdrawn from the furnace they have only to be passed on to an automatic cutting machine. This machine is in direct communication with a ventilator which draws off the powdered carbon produced in cutting.

"The construction of machines employed in the manufacture of electric-light carbons is also a Nuremberg specialty, and the house of Justus-Christian Braun has a monopoly of the business, and supplies machines in Europe and America. The cost of an outfit for a factory is put at 20,435 marks, irrespective of packing, transport, and customs charges."

Waltham Watch No. 6 000,000.

The American Waltham Watch Co. has just completed, ready for delivery, watch movement No. 6,000,000. The event marks an epoch in the history of this concern worthy of more than passing notice. The timepiece is the highest-grade nickel movement made by the company, new thin model, 16 size, ¾-plate, open face, and has all the latest improvements, including the Church patent pendant settings and stem-winding device and Church's patent micrometric regulator and Logan's patent Breguet hairspring. The train-wheels are gold, beautifully polished, and the jewels are the finest red ruby in raised gold settings. The most striking feature is the ornamentation of the plate by one of the company's best damaskeeners, and this work is undoubtedly the most beautiful and elaborate that ever was put on a watch.

The growth of the business of the American company since it commenced the manufacture of watches is well marked by the following figures: Watch No. 1,000,000 was completed in 1877, twenty years after Treasurer Royal E. Robbins purchased the plant. Watch No. 2,000,000 was finished in 1882, and the event was commemorated by the first foremen's supper. Watch No. 3 000,000 was delivered in 1886, and was presented to the Foremen's Association by the company, and it has since been carried by one of the foremen, being drawn by lot at the annual supper. Watch No. 4,000,000 was completed in 1889. Watch No. 5,000,000 was made for Treasurer Robbins and was finished in 1891. From the above it will be seen that it took 20 years to make the first million watches, 5 years for the second, 4 years for the third, 3 years for the fourth, 2 years for the fifth and about 18 months for the sixth. In completing this watch, the American company has made one million more watches than any concern in the world.

In such a vast establishment there is constantly in course of construction several hundred thousand watches, and a few days since the movement bearing the significant figures "6,500,000" was commenced.—Waltham Free Press.

Shop Hints.

To cut a gear wheel of an unusual size, pitch, or tooth-shape, sometimes bothers the average shop, which is equipped only with the standard cutters such as are furnished by two or three firms which have had the good sense to make their system of tooth curves uniform, so that every spur wheel of the same pitch will mesh with every other cut with the same set of cutters. Then again, some shops have no large milling machines; some have none at all; so even if they have the cutters they might not be able to use them. Again, it does not always pay to get a set of cutters for a job which may never have to be duplicated.

For such work it is very often perfectly feasible to use a slotting machine with a cutter of the shape of the tooth-space. The wheel or rack blank is first carefully graduated into the requisite number of divisions, if there is no graduated chuck on the slotter; then is bolted fast to the slotter-bed or table and a scribe mark made on the latter to correspond with one of the division marks on the edge of the wheel blank. Then the tool is set to work until a tooth-space is cut; the wheel is then turned or the rack slid along until the second division mark on its periphery or edge is in exact line with the scribe mark on the slotter-bed, and a second space cut, and so on.

It is well not to do all the work with one tool, but to have a rough cut taken for each space with a tool which will make the approximate outline, and then to finish off with one filed or ground exactly to the requisite outline.

For this class of work, as for many others, chilled cast-iron teeth will be found very desirable, as they keep their shape and take greedy cuts, and may be made of a special outline, such as that required for tooth-space cutting, more quickly and more cheaply than by forging.—Cincinnati Artisan.

SMELTING IRON SANDS.—It is stated that Mr. E. M. Smith, the member of New Plymouth (New Zealand), has been conducting some further experiments regarding his process for smelting ironsand, in the course of which a blast furnace at Onehunga was charged with the ironsand in the shape of bricks instead of with iron ore. A tapping took place, and the result was that several tons of ore were obtained from the furnace. The metal was pronounced by experts to be workable iron of first-class quality, far superior, in fact, to that hitherto produced from any of the New Zealand ores. A portion of the molten metal was converted into small castings, among which was a barrow wheel, and it stood this test in a highly satisfactory manner. The "bricks" with which the furnace was charged consist of an admixture of ironsand and clay, and were brought by Mr. Smith from New Plymouth, where they were manufactured 15 or 16 years ago. A further quantity, made of similar materials, has just been brought to Onehunga from the Avondale Brickworks, and is now being used to feed the furnace. Mr. Smith claims that the yield of iron is equal to 50 per cent of the weight of the bricks, and be is sanguine of being able to produce iron of a high class at a payable rate. Coke from the gray coal was used in the trials, and there being at the time a scarcity of limestone at the works, shells were used in its stead. Two truckloads of Kamo limestone have, however, recently come to hand, and will be used in future operations. The trials have been watched with great interest by the Onehunga people, to whom the development of the industry is of much importance, seeing that the west coast abounds with inexhaustible quantities of raw material in the shape of the deposits of ironsand.

Scientific Progress.

The Volatilization of Quartz.

It is not very long ago, says *Industries*, when the fusion of quartz was considered to be a feat sufficient to warrant a good deal of interest being displayed in the mode of manufacture as well as in the electrical properties of the quartz fibers with which the name of Mr. Boyes became so intimately associated. Now we have gone a step farther, and soon not only the fusion, but the distillation of quartz may become an every-day occurrence. Dr. Serger, the well-known German ceramic technologist, and editor of the *Thonindustrie Zeitung*, has published a paper in which he claims to have volatilized quartz in an appreciable quantity. It was noteworthy that the furnace employed was by no means a particularly sensational instrument. One would have expected that for an undertaking of this kind the very latest variety of electric or oxygen injector furnace would have been used, but the furnace actually chosen was of an older and more conventional type. It was of what is known as the Deville pattern, and consisted of a simple cylindrical sheet-iron case lined with dead-burnt magnesite, leaving an internal cavity of about five inches diameter and 11 inches high. The magnesite lining only extended about two-thirds the length of the cylindrical casing, which was divided at that point by a perforated iron plate, forming the floor of the furnace proper and supporting the crucible.

Below this division was the air chamber, into which a blast was injected by a side opening, and which served for the preliminary warming of the air before it came in contact with the burning fuel. The crucible was of carbon, and was inclosed of another of magnesite. The fuel used was retort carbon, and was kindled by a few fragments of burning charcoal. The quantity of the former used was 4 kilogrammes, which is certainly a very moderate expenditure. After the experiment it was found that the quart had undergone fusion, to judge by its appearance, and was noticeably smaller. When weighed, it was found to have been reduced to the extent of over 40 per cent, the total mass taken being 2.5 grammes, and the quantity that had disappeared amounting to 1.1 gramme. That this was in no sense due to accident was proved by repeating the experiment with another piece of quartz, with a precisely similar result. The comparative constancy of the loss might lead to the supposition that there was some limiting factor in the volatilization, but a second heating of the same test piece caused a further loss of about 15 per cent of the original weight, and on repeating the heating twice the piece of quartz vanished altogether.

It was observed in the course of the experiments that when the quartz was cooled rapidly it had an opaque, porcelain-like aspect, while when the cooling took place gradually the test piece was perfectly transparent. The results we have recorded are sufficiently startling, and if they had emanated from a less careful technologist than Dr. Seger, would be regarded with some doubt. Even as it is, one cannot help wishing that further details were forthcoming, to set at rest the supposition that some of the basic material with which the furnace was lined may have obtained access to the inner vessel, and by fluxing the silica have rendered it sufficiently fluid to soak into the substance of the crucible. The one way to clinch the matter is to ascertain whither the lost silica goes—in fact, to turn the volatilization into a true distillation. Who knows, when silica is fractionally distilled, of what homologous, but not identical, bodies it may not prove to be composed.

A PETRIFIED FOREST.—F. B. Schemerborn, Geologist of the Idaho World's Fair Bureau, who recently discovered the great glaciers in Idaho county, has found a fossil forest in the center of Custer county. In the same locality he has discovered the petrified bones of a now extinct race of men and animals, which will be sent to Chicago. The forest covers an area of four square miles and the condition of the ground shows that at one time an enormous flow of clay which worked in from the northwest has buried the tree trunks to a great depth. This clay has turned to stone and no one can ascertain its true depth without going to great expense. All the trees in this forest have their tops broken off and stand from 10 to 40 feet above the ground, averaging about 28 to the acre. Schemerborn took the exact measurement of some of the trees and found them to average 12 feet in diameter on top and 16 feet in diameter at the surface of the ground. How far the trunk reached through the clay stone to the soil he had no means of ascertaining. A branch which had become detached from a tree and was lying about 16 feet from it was three feet in diameter. From the size of the trees and their branches Mr. Schemerhorn thinks they are a species of redwood such as is found in California and attributes their fossilization to the clay, which, bearing a large part of mineral and presumably coming from some volcano, soon turned the living trees into monuments of stone.

A New Aluminum Process.

A private exhibition to a few interested capitalists was given recently of the new process for making aluminum invented by Col. William Frishmuth, at the laboratory of the Enterprise Aluminum Co., Rush and Amber streets. The process is partly chemical and partly electrical, the aluminum oxide being extracted from pure clay and dissolved. The solution is then exposed to the electric current, which causes the pure metal to be thrown down on brass plates. From this it is removed by an ingenious but very simple chemical process in a state of almost perfect purity and in the form of a silvery impalpable powder. It only remains to smelt it into ingots. Col. Frishmuth estimates that the aluminum can be extracted at a price far below its present market value and in any desired quantity. But a singular circumstance connected with it is that the byproduct or residue from the chemical treatment of the clay possesses high value as a fertilizer, and this, it is claimed, will be sufficient to pay all the expenses of the operation. An analysis of the byproduct, made by an expert chemist without knowledge of how it was produced, was submitted. He estimated its value as a fertilizer at from $8 to $10 per ton.

A charter has been procured and a company formed which will immediately proceed to manufacture the metal commercially. It is designed to operate the first plant in this city for a time, the clay being brought here from New Jersey, where a bed free from deleterious substances is found. The promoters are so confident of success that they think that in a short time the profits will enable them to put up extensive works in the immediate vicinity of the beds.—Philadelphia Ledger.

Testing Gas with a Hydrogen Flame.

At a recent meeting of the British Association, Prof. Clowes, of University College, Nottingham, described the application of a hydrogen flame in an ordinary safety lamp to the detection and measurement of inflammable gas or vapor. *Engineering* (of London), in its account of the meeting, says:

The coalminer detects and measures roughly "fire-damp" in the air with the help of the "cap" over the flame. The ordinary oil flame does not with certainty detect less than 3 per cent of fire-damp. Pieler's alcobol flame indicates 0.25 per cent readily, but gives no light, and can be used for gas-testing only. The Ashworth lamp, which Dr. Clowes showed last year at Cardiff, and which burns benzoline, detects 0 5 per cent of fire-damp when the wick is pulled down until it gives a pale blue flame only. He now described a miner's lamp in which the ordinary flame can at once be replaced by a hydrogen flame, which indicates and measures from 0.25 to 3 per cent of fire-damp. As soon as the delicate testing is finished, the ordinary flame is kindled and can be used for either illumination or for detecting higher percentages of fire-damp. The hydrogen gas is carried in a small steel reservoir slung over the shoulder by a strap, and is introduced through a fine metal tube terminating in the interior of the safety-lamp near the wick. The "cap," produced by air containing 1 per cent of coal-gas, was four times as high, and half as high again, respectively, as the "caps," over a benzoline and an alcohol flame of the same height. The hydrogen safety-lamp is also specially suited for spaces in which petroleum oil has been stored, where naked flames have caused many an accident; it detects 1-20th of the amount of petroleum vapor which can be kindled in the air, and 1-30th of the amount which explodes when mingled with air, as Dr. Clowes ascertained from experiments in his test-chamber.

THE Siemens & Halske Co., of Chicago, an American branch of the famous Berlin firm, has taken a contract for what is claimed to be the largest isolated electric plant in existence, that for the Auditorium building in Chicago, and its new annex across the street, Congress Hall. The original Auditorium plant was of Edison manufacture, and this will be removed and the Siemens & Halske plant substituted.

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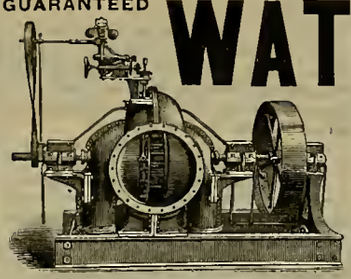

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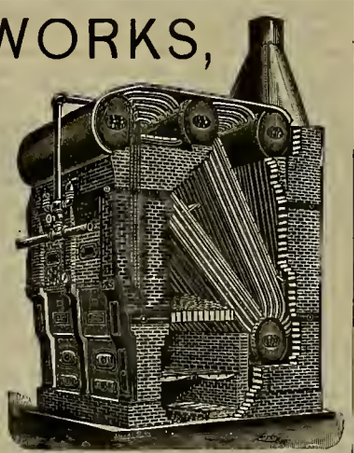

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Durability of Stone.

The physicial properties which contribute to durability of stone are the hardness, toughness, homogeneity, contiguity of the grains, and the structure, whether crystalline or amorphous. Although hardness (resistance to crushing) is often regarded as the most important element, yet resistance to weathering, does not necessarily depend upon hardness and the nonabsorbent properties of the stone. A hard material of close and firm texture is, however in those qualities at least, especially fitted to resist friction, as in pavements and roadmetal and the wear of raindrops, dripping rainwater, the blows of waves, etc. Porosity is an objectionable element. An excessive porosity increases the layer of decomposition which is caused by the acids of the atmosphere and of the rain, also deepens the penetration of frost, and promotes its work of disintegration. If the constituents of a rock differ greatly in hardoess, texture, solubility, porosity, etc., the weathering is unequal,, the surface is roughened, and sensibility of the stone to the action of frost is increased. The principle which obtains in applying artificial cement, such as glue, in the thinnest film in order to secure the greatest binding force finds its analogy in the building stones. The thiuner the films of the natural cement and the closer the grains of the predominant minerals, the stronger and more durable the stone. Of course the farther separation produced by fissure, looseness of lamination, cavities, and geodes and excess of mica teods to deteriorate still further a weak building stone. Experience has generally shown that a crystalline structure resists atmospheric attack better than an amorphous one. The same fact is generally true with the sedimentary rock also, a crystalline limestone or good marble resisting erosion better than earthy limestone. A stone that is compactly and finely granular will exfoliate more easily by freezing and thawing than one that is coarse-grained. A stone that is laminar in structure absorbs moisture unequally, and will be seriously affected by unequal expansion and contraction, especially by freezing and thawing. Such a stone will gradually separate into sheets. A stone that has granular texture, as constructed with one that is crystalline or fibrous, will crumble sooner by frost and by chemical agents, because of the easy dislodgment of the individual grains. The condition of the surface, whether rough or smooth, influnces the durability, the smoother surface being the better. The stone is more durable if the exposed surface is vertical than if inclined. The lamination of the stone should be horizontal.—Operative Builder.

How They Moved Obelisks.

The obelisks of the Pharaohs are made of red granite called syenite, says the writer of "Cleopatra's Needle." In the quarries at Syene may yet be seen an unfinished obelisk, still adheriog to the native rock, with traces of workmen's tools so clearly seen on its surface that one might suppose they had been suddenly called away and intended soon to return and finish their work. This unfinished obelisk shows the mode io which the ancients separated these immense monoliths from the native rock. In a sharply-cut groove marking the boundary of the stone are holes, evidently designed for wooden wedges. After these had been firmly driven into the holes, the groove was filled with water. The wedges, gradually absorbing the water, swelled and cracked the granite throughout the length of the groove. The block, once detached from the rock, was pushed forward upon rollers made of the stems of palm trees from the quarries to the edge of the Nile, where it was surrounded by a large timber raft. It lay by the river side until the next inundation of the Nile, when the rising waters floated the raft and conveyed the obelisk down the stream to the city where it was to be put up. Thousands of willing hands pushed it on rollers up an inclined plane to the front of the temple where it was designed to stand. The pedestal had previously been placed in positioo and a firm causeway of sand covered with planks led to the top of it. Then, by means of rollers, levers and ropes made of the date palm, the obelisk was gradually hoisted into an upright posltion. It speaks much for the mechanical accuracy of the Egyptian masons tbat, so true was the level of the top of the base and the bottom of the long shaft, in no single instance has the obelisk been found to be out of the true perpendicular.

THE "JINGLET" IN THE BELL.—"The making of sleigh hells is quite an art," says a manufacturer of Maine. "The little iron ball is too big to be put in through the holes in the bell, and yet it is inside. How did it get there? The little iron ball is called 'the jinglet.' When you shake the sleigh bell it jingles. In making the bell the jinglet is put inside a little ball of mud, just the shape of the inside of the bell. Then a mould is made just the shape of the outside of the bell. This mud ball with the jinglet inside is placed in the mould of the outside, and the metal is poured in, which fills up the space between the ball and the mould. When the mould is taken off you see a sleigh bell, but it will not ring, as it is full of dirt. The hot metal that the bell is made of dries the dirt so it can be shaken out. After the dirt is all shaken out of the holes in the bell, the little iron jinglet will still be io the bell and will ring. It took a good many years to think out how to make a sleigh bell."—Ex.

MACHINERY IN SHOEMAKING. — The chief tools of the shoemaker then consisted of the hammer, his awl, his lapstone, his knives, and his harness for "setting up" his boots or shoes. The essentials of a shoe are the upper, the sole, the counter or heel stiffening, and the heel. These parts are again subdivided into the "vamp" for covering the front of the foot, the large and the small quarters for encircling the ankles, the button-piece, etc. The work of the shoemaker is to prepare and close these various parts of the upper and the linings together, to bring them into the desired shape, to fasten them to the sole which has been previously cut, to attach the heel, and then to give the various parts the desired finish and style. These processes indicate the lines along which machinery had to be applied. All the operations have been subdivided to the minutest detail, and in the performance of all of them, machines—more or less satisfactory in their workings—have been devised. The parts of the uppers are now sewed togetber by machinery, and they are pegged, sewed or screwed to the sole by machinery. Instead of the lapstone and the hammer for condensing the leather are now swiftly revolving rollers, and instead of the patterns for cuttiog out the soles are dies or sole-shaped knives set in machines. — George A. Rich, in the Popular Science Monthly.

THE ERICSSON SUBMARINE GUN.—The trials made with the submarine gun of the Destroyer at the New York navy yard have shown some interesting results. The gun was fired a number of times at different depths under water, and while there was some disappointment as far as accuracy of direction was shown, a record of ten shots shows that all of them would have hit a ship drawiog 22 feet below the water-line at a range of 100 feet. Nine of these would have been effective on the same vessel below the water-line at 200 feet; four at 300 feet; three at 400 feet, and two at 500 feet. The official report has not yet been published, but it may be said that the tendency of the projectiles to rise to the surface was somewhat less than had been expected, and the main difficulty found was in accuracy of direction. Some further trials are still in progress.—Railroad and Engineering Journal.

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AN American consul in Fraoce reports that the road system of that country (the best system in the world) "has been of greater value to the country as a means of raising the value of lands than have the railways. In France every market cart, with its broad tire, is a roadmaker."

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Krochnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

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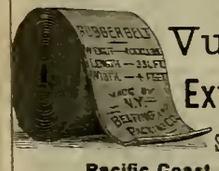

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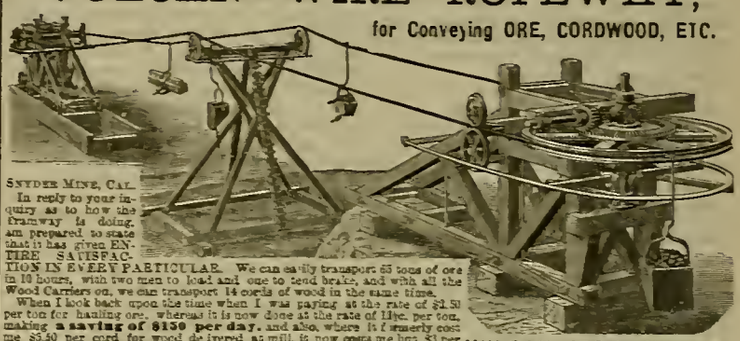

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Electricity.

Application to Mining Operations.

At a meeting of the Illinois Mining Institute, Elmer A. Sperry read a paper on "The Application of Electricity to Mining Operations," in which he said: The problem of replacing manual labor in coal-mining has engrossed the labors and thought of the ablest engineers of the age. Some of the earliest patents granted by the English monarchs were for mechanical mining devices with an avowed object of superseding manual labor. These machines were driven by animal or hydraulic power, and more recently by steam or compressed air.

They sawed, scraped, cut and plowed, but principally struck a blow. Many, even to a recent date, swung a pick provided with the ordinary transverse handle or power connection. Few, if any, of these machines have been successful under the severe duties required, and none have withstood the test of time. Machines generally employed in cutting or scraping devices are of limited application. They are worked with success where the seam is clear; but this, however, is the exception. The presence of iron pyrites or other foreign substances in the strata quickly dulls the knives and requires such heavy driving powers as to preclude commercial use. I have witnessed the operation of this type of machine in strata excellently adapted for machine-mining except for a frequent deposit of sulphur about the thickness of a silver dime.

These foreign substances are the bane of mechanical coal-cutting; they exist in the form of thin layers, thick layers, balls and boulders. The various forms are known to the miner as sulphur balls, lime balls, boulders, bone coal, etc. They are of extreme density, and their hardness is so great that even with the diamond drill they are considered the most difficult mineral substance encountered. With this foreign matter occurring in irregular forms and in masses of irregular distribution, it will at once be recognized that breakers are ahead of the designer, and that good engineers have been baffled in this field is not a matter of so much surprise.

The widely-varying systems of mining employed in the different districts still further render any single machine, which is equally well adapted to all, difficult of construction. Such a universal machine is, however, none the less desirable, and is doubtless approached most closely by the direct blow or reciprocating action, imitating in this feature, the time-honored pick, placing a force behind it never before obtainable. Such a machine may be perfectly guided and directed while in operation. It is the only machine that may be used for almost any condition or quality of coal, foreign substances, underlying strata or system of mining. It may be used for entry-driving, undercutting, digging or shearing.

Regarding electric haulage, Mr. Sperry said that it had been looked upon by the foremost operators as the coming system, and one which is destined to solve the problem of the economical transfer of the heavy product in mines. In studying the problems of electric haulage for mines one is met with the fact that the tracks are poor and light, the roadbed is crooked and irregular as to levels and generally of light construction. The curves, owing to the necessity of leaving pillars, and having connected sight entries, admit only of small radius curves, and excessive grades are often met with in the dip of the seam which cannot be obviated by cuts or fills as on surface roads, without great expense, especially if the entries are timbered, which is usually the case in western collieries. Yet a service of the highest efficiency and greatest capacity in speed and tractive power is required. The motor must work double shifts if necessary, and he at all times under perfect control of a motorman receiving $2.25 per day, and never fail for an instant.

The matter of stability of roadbed is a relative one. There are conditions under which a 10-pound rail would be as stable for a light locomotive as the New York Central's 100-pound rail is to the tremendnus load per driver in the high-speed locomotives recently placed in service on that road. Pounds' pull at the draw-bar is only obtainable by pounds' weights at the rail, yet for a heavy draw-bar pull it is not necessary to have the weight upon any one driver excessive.

The rule in determining the rail section required, is to multiply the tons' weight upon a single driver by 10, which gives the pounds per yard of rail section required. In the above instance 40 tons are upon four drivers, 10 upon each, which, being multiplied by 10, gives the 100-pound rail now being laid. In the case of my electric haulage of eight tons with eight drivers we have a ton per driver, multiplied by 10 equals a 10-pound rail, but a heavier rail is advised, not requiring as frequent cross-ties.

Mapping the Magnetic Field.

The common method of obtaining a cross-section of the field of force of a magnet by means of iron filings is very satisfactory when only temporary representations of the field are desired, but there has been wanting a suitable method of making a permanent map. It occurred to the writer that by employing a photographic dry plate a negative could be obtained from which any desired number of prints could be made, and it would have the additional advantage of representing the figures in their true colors. For obtaining the field of a bar magnet, the magnet was placed upon a large card previously marked with concentric circles and parallel lines to facilitate the centering of the magnet. A photographic dry plate was placed, film side up, directly upon the magnet. Iron filings were held at a distance of a foot above the plate in a bag of loosely-woven flannel, from which, by shaking the bag, they could be evenly distributed over the surface of the plate. The plate was then held at two points and tapped gently until the filings had arranged themselves along the lines of force. The room up to this point was, of course, only illuminated by nonactinic light, and the exposure was now made by turning the key of an electric lamp supported at a convenient distance directly above the center of the plate. The position of the lamp is a matter of considerable importance, as light from one side of the plates will cause the filings to cast a shadow and give an incorrect representation of the lines of force. Where an electric light cannot conveniently be used, nearly as good results may be obtained by holding a lighted match over the plate. After the exposure the plate is tapped so that the filings may slide off, and the few which still cling to the surface of the film are carefully removed by means of a fine camel's-hair brush. The negative is then developed and fixed in the usual way. The plates employed should be of a sort to give the strongest possible contrast, and a slow plate, such as Carbutt's process plate, was found to give most satisfactory results, it requiring an exposure of about 20 seconds. For making prints from these negatives any paper may be employed which will give good black and white tones. To obtain the best results the magnet should be a strong one and of considerable size, since the film is of necessity placed the thickness of the glass away from the magnet. It is also quite necessary to employ a considerable quantity of filings in order to make a brilliant negative. Very beautiful results are obtained by this process, which afford an excellent opportunity for a careful study of the magnetic field.

Since preparing the above, my attention has been called to the excellent article of Prof. Houston, in which a method exactly similar to the one here described was briefly outlined. This furnishes another instance of the simultaneous invention of a process by two inventors, each working wholly without knowledge of what the other is doing. C. B. Thwing in Electrical World.

ELECTRIC-HEATING—Without doubt the leading feature of the exhibition at the Dominion capital is the electric-heating display, the inventions of Thos. Ahearn, one of the proprietors of the electric street-railway of that city. The electric oven is inspected by thousands who through glass doors witness the process of baking in all its branches. The oven is about seven feet square and six feet high, substantially built, surmounted with small electric-lights, and within it are placed the electric-heating appliances which are fed from the ordinary electric-light service wires. The interior dimensions of the oven are four feet square, the ceiling being low and oval in form. An oblong window on one side permits visitors to watch the progress of the baking of bread, buns, etc. A dough-mixing machine driven by an electric motor is used in connection with the electric oven. The heating of houses by electricity is also demonstrated. A small electric furnace has been placed in a brick pit below the surface of the floor, and pipes leading from the furnace conduct the electrically-heated water through a radiator such as is used in house-heating. Mr. Ahearn has also arranged a novel form of electric-heating for the main building refreshment room, which will be conducted by the ladies of the W. C. T. U. The 12-gallon electric heaters connecting by pipes with five small heaters are used for making the tea and coffee supplied from this lunch room. —Electrical World.

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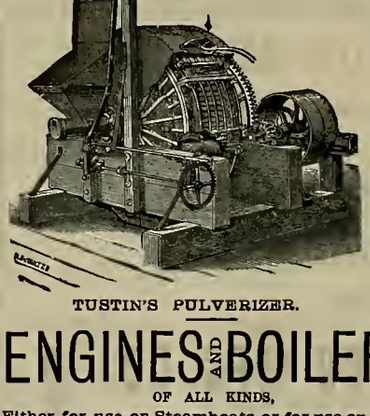

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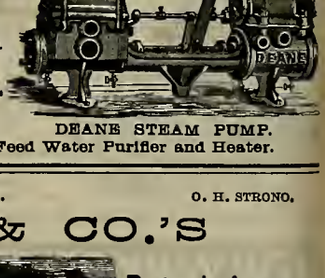

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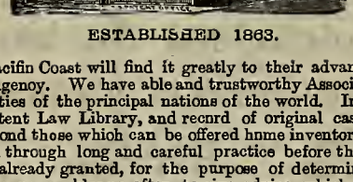

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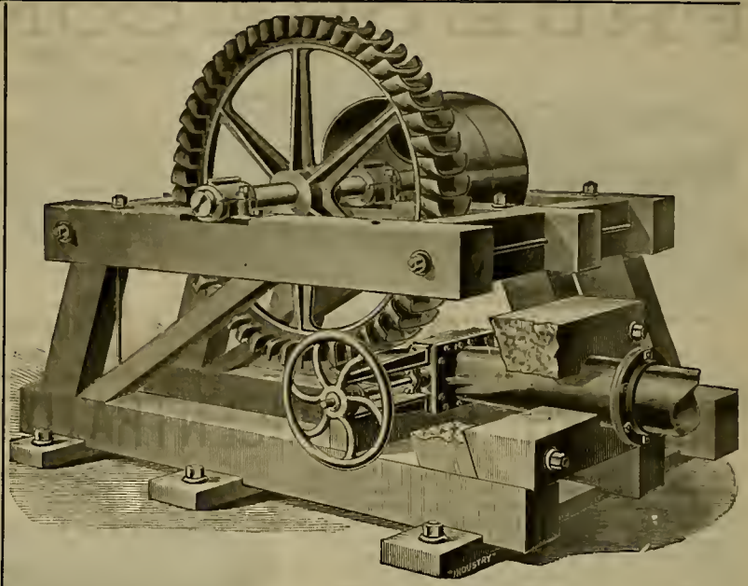

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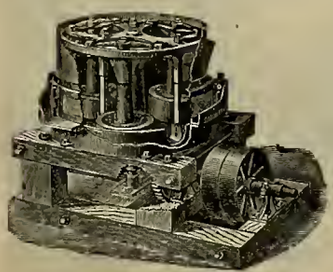

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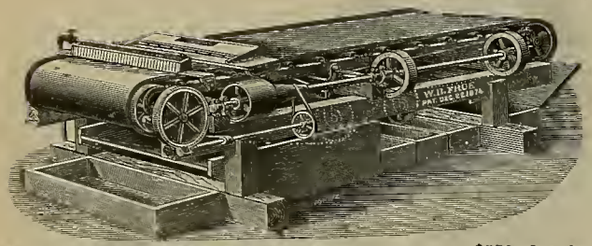

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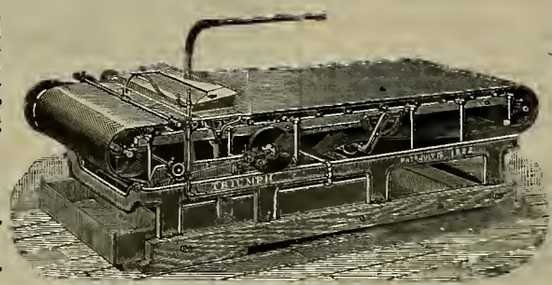

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At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID MCKAY, JR.,

Signed] Sup't North Star and Original Empire Mining Co.

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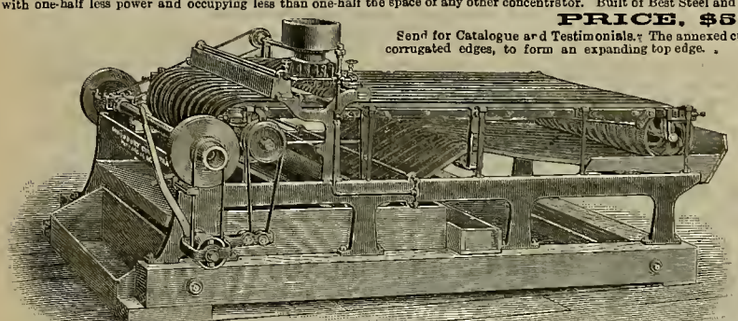

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[Copy] Yours faithfully, S. HARRIS, Manager.

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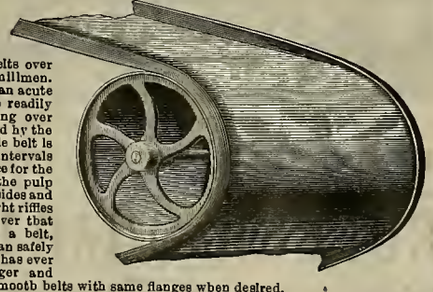

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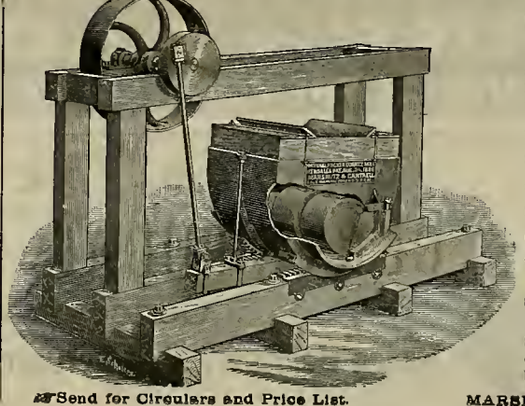
IMPROVED PORTABLE HOISTING ENGINES.

NATIONAL ROCKER QUARTZ MILL.

KENDALL'S PATENT, AUGUST 24, 1886.

CAPACITY, 12 Tons in 24 Hours. 3 H. P.

MARSHUTZ & CANTRELL, Sole Manufacturers.



The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:

1. The cost is less than one-half of stamps of same capacity.
2. The freight to mine is less than one-half of stamps.
3. The cost of erecting is less than one-fourth of stamps.
4. The power to drive it is less than one-half of stamps.
5. The wear is less than one-quarter of stamps.
6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

We challenge competition with Stamps, Ball Pulverizers or and other ore crushing machines now before the public.

☞Send for Circulars and Price List.

MARSHUTZ & CANTRELL.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

BAY STATE.—Amador *Dispatch*, Oct. 15: A vein of water has interfered with the work in the shaft at the Bay State, and operations there are suspended, for a time, until they can get in a pump to draw out the water.

AFTER QUARTZ.—Amador *Ledger*, Oct. 15: During the last month there have been more mining men from abroad prospecting around Jackson for quartz than for a long time before. There is no doubt that this influx of interested gold-seekers results from the report of the director of the mint upon the production of the precious metals in the United States for 1891, which places Amador second in the list of county-producers, and the Kennedy first in the list of mines in the State, with a production of gold and silver of $490,008.90. H. P. Holland, the inventor of the Holland concentrator, and George Serin, capitalist, both of San Francisco, have been for several days prospecting in the Amador Queen No. 2. They propose to take a carload of ore to San Francisco and test it by a new process, invented by Mr. Holland, and if it returns well, the people interested with them will procure the mine and work it to its fullest capacity. Rumor has it that the Clinton Consolidated is soon to be purchased by an English company. The Bay State mine is crushing 250 tons of rock at the Pacific mill, which from indications will pay about $8 in free gold.

SUTTER CREEK.—Our town is gradually nearing what many think a boom. Everything in connection with the mines is all life and activity. Developments at the Hector are going along nicely. The report in last week's issue in relation to the inadequacy of the power to run the entire machinery, I am pleased to state, was a mistake. Mr. Valentine states that they are already running 30 stamps, and can run the entire machinery without the least trouble and have power to spare. This is very gratifying news, as it was believed on the outside a week ago that the company would likely be hampered to some extent in this direction. In blasting at the 600-foot level, rock has been encountered of exceedingly good quality, and has every indication of permanency. Taking everything into consideration, the outlook for the Hector has never been so bright as at the present time. The South Eureka Company having decided at their meeting in Sutter Creek last week to sink 300 feet right away, preparations are being made as rapidly as possible, and I expect to report in my next three shifts in the shaft. The Wildman is looking fine, the 30 stamps being kept going steadily, and the ore being crushed is of a good average quality. The outlook for permanency is better than at any previous time. The Belmont is running along with the same crew of men. Mr. Tibbitts is hopeful of getting new hoisting machinery in the near future, which will be of great advantage to the mine.

Calaveras.

MINES RUNNING.—Calaveras *Chronicle*, Oct. 15: Mining has taken quite a boom during the last few months in our neighborhood, especially in the vicinity of Central hill and Chili gulch. There have been six new mining enterprises started during these few months. The Quaker mine, located in Chili gulch east of the Junction, is now in active operation under the management of Mr. Hugh McSorley. A shaft has been sunk on this mine a depth of 600 feet and a tunnel run west in order to crosscut the vein. This tunnel or crosscut is now nearly completed and a fine body of rock developed. It now has every indication of being one of the best paying properties ever opened up in this county, and that is saying a great deal for the Quaker. The Rigney mine is located in Chili gulch north of the Junction, and is under the management of Mr. Edward Rigney of Oakland, but formerly a resident of Mokelumne Hill. Mr. Rigney has done a great deal in the way of promoting the mining interests of Calaveras county. On this mine a shaft has been sunk 60 feet, and a crosscut made to determine the width of the channel. In running this crosscut Mr. Rigney came in contact with a large body of water, compelling him to cease operations until he could go below and purchase the necessary machinery to handle the water. The machinery is now at Valley Springs and in a day or two will be at the mine. It consists of a small engine and boiler and a large double-acting pump. The Williams mine, on the old blue lead at Mr. Williams' ranch, is now in operation under the able management of Mr. Vernon Wilson, a young gentleman from Oakland, who has been here for the past few months in the interest of Oakland capitalists in the way of selecting a mine. It is the general impression that he has made a very good selection. The old Coffee Mill mine, at the base of Golden Gate mountain, is now being operated by a company of San Francisco capitalists. A shaft has been sunk to a depth of over 200 feet, and a drift running east 25 feet tapped what is known as the old Bob Paul or Coffee Mill channel, and from present indications there will be a large force of men soon put at work in the mine. The company intend to erect the necessary buildings, and we are also informed that a 10 stamp mill will be put on the mine shortly. The What Cheer mine near Chili gulch, under the superintendency of Mr. F. J. Horswill, is running in full blast. There is no doubt but that under Mr. Horswill's management it will be made a good paying property. Mr. Horswill is also managing the Baker mine, situated near Central hill, in which he is sinking a shaft to a depth of 330 feet. He has already erected a large plant for hoisting purposes, propelled by gasoline, the first one of the kind ever introduced in this county. It is remarkable to note the difference in this section of the county. It reminds one of old times to see all the mines running in full blast.

Humboldt.

OIL STRIKE.—Alton *Home Journal*, Oct. 13: Many rumors concerning the East Branch oil well were afloat last week, and a big strike of oil was alleged to have been made. It is supposed that these rumors were started by some one who wanted to dispose of some oil stock. The principal stockholders of the Humboldt Oil Land Company, who are doing this work, are still confident of success. The drill still goes down, and prospects continue to be favorable. Superintendent Gilfillan has been hopeful from the start. The work has been hard and tedious, and many difficulties have had to be overcome, and though nothing wonderful has yet been accomplished, the parties in charge of the work are satisfied with the experiment and would not be so very badly disappointed if they had to bore two or three wells before oil was found in paying quantities. This has been a part of their calculations from the start. Superintendent Gilfillan is an expert in such matters, and is certain the oil is there, and though the reward of his labors may be deferred for the time being, pluck and perseverance is bound to win.

SILVEA.—Mr. B. L. Gillespie is still working at the ledge of silver ore on his place between Fruitland and Harris. He has followed up the ledge for some little distance, and the vein seems to grow wider and richer as the depth increases. Some samples of rock sent to an expert mineralogist in Denver, Colorado, assayed at the rate of $7 to $13 per ton. This is encouraging, and the development will be continued.

Inyo.

BIG PINE.—Cor. Inyo *Register*, Oct. 13: The political canvass has not operated to prevent transfers of Inyo property. C. A. Collins has about completed the negotiations for the transfer of the 16 claims at Pine mountain. This is the camp where Andy Fife and others have been running concentrators. The parties who examined this property, Messrs. Gifford and Book of Los Angeles, expressed themselves well pleased with the outlook. It is expected that the transfer will soon be made, and that the purchasers will put on a force of men to take out a quantity of concentrating ore during the winter, and that in the spring the new company will put on a 20 stamp mill. C. A. Collins has spent a month at Los Angeles, and has been able to place some ranch property of this section. He has purchased for C. M. Persons of Los Angeles the Tom Hughes ranch, and informs your correspondent that other important transfers are on the tapis. The little camp of Fish Springs is forging to the front. Broder, Gilliam and others are running out a lot of rock which they expect to net them $40 per ton. Big Pine parties are interested in some fine locations of graphite in the mountains west of Bishop. Specimens have been sent out for classification, and local experts pronounce the article to be the genuine quality.

MILL SOLD.—The big mill at Mammoth is reported sold to Jas. Cain of Bodie. The price is variously stated at from $1500 to $2000, which amount is but a small fraction of the cost of freighting it into where it is. The whole plant originally cost at least a hundred times its selling price. Stories vary as to what will be done with the plant, one version leaving it where it is, another saying that it is to go to Lundy.

Nevada.

BAUNSWICK MINE.—Grass Valley *Union*, Oct. 15: Superintendent Fitzgerald reports: Since last report the mine has improved materially both in quantity and quality of ore coming in. Average width of ledge in drift, one and a half, that assays from $10 to $50 per ton, and since work was resumed in the drift and shaft, has improved steadily. The ore in the bottom of shaft shows good assays and has increased since being sunk on. I have stopped sinking for the present to put in a tank for holding the water down to the 600 level, and will use the four-inch pump to sink the other lift; will also push both drifts 100 feet each. Face of both drifts at present time is in good milling ore and has been improving. Stope has been sunk the past week seven feet; total depth of shaft 625 feet. East drift extended four feet; total number of feet, 584. West drift, four feet; total, 68 feet.

CENTENNIAL GRAVEL.—*Transcript*, Oct. 14: Latest advices from the Centennial are to the effect that the drifts both east and west from the main tunnel are progressing in the back channel ground. It is about two feet above the track floor and shows well. All taken out in the exploration is saved up for washing when the sluices are constructed. The width of the gravel deposit at that point is expected to be fully as great as that developed in the front channel.

CHAMPION.—Grass Valley *Union*, Oct. 15: The new works on the Champion mine are approaching completion. They have been renewed and reconstructed throughout, and when ready for service will equal any in the county. Fifteen additional stamps have been put in, making 40 in all, which will give a largely increased reducing capacity. The condition of the mine is all that could be desired, as there is a large body of high-grade ore opened up, which insures the continuance of regular and large dividends. The Champion is an enterprising company, and under the management of Superintendent Fred Zeitler, has become one of the leading mines of the county.

MERRIMAC MINE.—Work at the Merrimac mine has been temporarily suspended, pending the introduction of electric power by the new company that has commenced the construction of works on the South Yuba river. The shaft of the Merrimac has now reached a depth at which larger pumps are required, and the putting in of these would necessitate heavier steam machinery or the introduction of waterpower. The electric power is preferred, and as there is a promise that it will be available by the opening of spring, the company deems it economical policy to wait for that event. The mine is looking well, the shaft carrying a strong vein of quartz which is of fair milling quality, and when the necessary power is secured there is no doubt that the mine can be worked to a profit.

GOOD PROSPECT.—James R. Nickeson returned from diamond creek yesterday, where he is having work done on several mining locations that he has in that region. He brought some of the quartz taken from the croppings that was literally sprinkled with free gold, and gave fine prospects. The ledges are large, being from eight to twelve feet on the croppings.

Mono.

THE BODIE CON.—*Miner*, Oct. 14: During the past week east crosscut No. 1, 550-foot level, was extended 10 feet. Winze below the main north drift, 550-foot level, was extended 5 feet. North drift from No. 3 upraise above the 300-foot level was extended 6 feet. Upraise above the 200-foot level was extended 8 feet.

THE MONO.—During the past week south drift, 550-foot level, was extended 28 feet. Started a west crosscut from above south drift and extended the same 11 feet.

Placer.

A BIG CLEAN-UP.—Auburn *Herald*, Oct. 15: The Morning Star mine is located about half way between Auburn and Ophir, close to the Eclipse mine, on the Doty's Flat road. Its owner is Otto T. Walter, of Ophir. Last spring he allowed Frank Miller and R. F. Miller to work the mine for a royalty. They took out a crushing of 10 tons which paid them at the mill $57 a ton. On the 1st of June they entered into a formal lease for six months, agreeing to work the mine and pay Mr. Walter 10 per cent of all they should realize. Last week they made their first crushing of 30 tons under the new lease. They cleaned up Saturday and found that they had, as the yield of their 30 tons of rock, over 20 pounds of retorted gold, or, to be exact, just 331 ounces, about $5000. They are only down 40 feet, at which point they started a drift and this last crushing was all taken out in removing 75 feet of the drift. The ledge varies from one to three feet in thickness and is all picking ground. If the strike was in some remote place, difficult of access, it would cause a panic; but as it is right here in the midst of civilization, in a country easy of access, it will cause no rush to this locality and no special flurry of excitement. It will serve to prove, however, that there are still some rich quartz mines remaining undeveloped in this part of California.

Shasta.

AT SOUTH FORK.—Shasta *Courier*, Oct 15: We understand that Pat Marley has disposed of his mining plant at South Fork, and that the trouble has been adjusted all right and things will probably soon be running in a satisfactory manner. The Gladstone mine did not shut down, as was reported last week, and the whole works are running full blast.

Sierra.

WILL CRUSH.—Grass Valley *Telegraph*, Oct. 15: To-morrow Andrew Husom will go to the Lone Star mine in Sierra county, and will take out several tons of the ore and have it crushed. There are various predictions as to what the ore will yield, and no one has rated it so low but that it will be profitable to work. The ledge is a very large one.

Tuolumne.

THE HAM & BIRNEY.—Tuolumna *Independent*, Oct 15: The Leechman Prospecting Company is extending operations by opening up the Ham & Birney mine. They are now putting in a Huntington mill and Woodbury concentrators. They will also put in two Dodd wheels.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Chronicle*, Oct. 15: There has been extracted from all parts of the mine during the week 987 1450-2000 tons of ore which was shipped to the Morgan mill, the average value of which, per car samples, was $26.20 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $22.70 per ton per battery samples. Bullion on hand in our assay office, assay value, about $16 500.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, the west crosscut No. 2 has been advanced 16 feet; total length, 149 feet; in porphyry and clay carrying a little quartz of nominal value.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 27 feet; total length west from the joint shaft, 2509 feet. The face is in hard, black porphyry.

MEXICAN.—On the 1465 level the west crosscut, started from the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 21 feet; total length, 154 feet, continuing in a soft porphyry and clay formation.

UTAH.—The north drift from west crosscut No. 2 has been extended 18 feet; total length, 96 feet. This drift continues in porphyry and clay showing some quartz.

SIERRA NEVADA.—The Cedar Hill drift has a total length of 40 feet; face in porphyry with streaks of low-grade quartz. The intermediate tunnel between the Cedar Hill drift and Kenosha tunnel has been advanced 17 feet; total length 37 feet; face in porphyry.

ANNEX.—During the week have been engaged in timbering east crosscut No. 1 north; work resumed to-day in face of the crosscut.

GOULD & CURRY.—On the Sutro tunnel level, the joint north drift with Savage Co has been advanced a total distance of 585 feet; face in porphyry. Have finished cutting the drain from the main tunnel to the face of the drift.

BEST & BELCHER.—900—During the week the west crosscut No. 2 has been advanced 19 feet; total length 37 feet; face in porphyry, clay and stringers of quartz.

HALE & NORCROSS.—1800 level—During the week advanced No. 1 west crosscut 12 feet; total length, 62 feet; face in porphyry and quartz. West crosscut No. 2 on this level was advanced 13 feet; total length, 46 feet; face is in quartz and porphyry. Advanced west crosscut No. 3 15 feet; total length 33 feet; face in quartz and porphyry.

CHOLLAR.—We are making repairs on the various levels. The east crosscut, 160 feet south of north line, 930 level, is out 140 feet; face in soft porphyry.

POTOSI.—Extracted and sent to mill the past week 447 300-2000 tons of ore from the 550, 930, 1100, 1150 and 1300 levels. Worked during the week 400 tons. On hand at mill 77 1200-2000 tons. Average battery assay, $18.04. Average car-sample assays, $21.05.

WARD SHAFT.—The joint Alpha and Exchequer west crosscut, 1800 level, has been stopped and a crosscut started east on north line of Alpha, which is out 14 feet; face is in clay and porphyry. The joint Potosi and Bullion, northwest drift, 1800 level, is out 958 feet; face is in hard porphyry.

BULLION.—The north drift, from top of raise from east crosscut, 320 feet south of north line 1300 level, is out 78 feet; face in quartz and porphyry yielding low assays. The joint southeast drift from bottom of Potosi winze, 1850 level, is out 147 feet; face is in porphyry. The northwest drift from 1800 station, Ward shaft, is out 958 feet; face in hard porphyry.

ALPHA.—The joint northwest crosscut on north line of Alpha, 1800 level of Ward shaft, has been stopped and a crosscut started east from the same point, which is now out 14 feet; face in clay and porphyry.

EXCHEQUER.—The joint northwest crosscut on the north line of Exchequer, 1800 level of Ward shaft, has been stopped and a crosscut started east from the same point, which is now out 14 feet; face is in clay and porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extracted 170 tons of ore and milled 80 tons of the value of $17.40 per ton as per battery samples. Have done no work on 750 level this week. The Zadig drift, Sutro tunnel level, has been extended 24 feet in hard porphyry.

NEW YORK.—The west crosscut, 110 feet north of shaft, 800 level, is out 37 feet; face in quartz and porphyry. During the past week we have hoisted 60 carloads of ore from the 650 and 750 levels that will average about $40 per ton.

SILVEA HILL.—We are stoping out on a streak of ore on the 260 and 490 levels. Have started a raise on this level from the Hillyer stope; top in low-grade quartz. Extracted and sent to mill the past week 191 445-2000 tons of ore from the 260 and 490 levels. Milled during the week 191 445 2000 tons of ore. Average battery assays, $19.96; average car-sample assays, $28.59.

Tuscarora District.

NAVAJO.—*Times-Review*, Oct. 15: The stopes above the 350-foot level continue as at last report. Sent to concentrator 105 cars of second-class ore.

BELLE ISLE.—The stope above the 350-foot level is looking very well, and the stopes above the 250-foot level ore improving. Sent to the concentrator 62 cars second-class ore.

NORTH BELLE ISLE.—No. 1 north drift, south 300-foot level, extended five feet; the vein is not so wide, but the ore is more compact. North intermediate above the south 400-foot level extended four feet; still yielding good ore. Sent to the concentrator 26 cars second-class ore.

ARIZONA.

MATTE SHIPMENT.—Prescott *Courier*, Oct. 15: Messrs. Stoddard and Taft came in from the Agua Fria Copper Company's properties yesterday. Mr. S. is the company's superintendent. He shipped a lot of matte and bullion yesterday. The bullion carried a very healthy percentage of gold. Both gentlemen bring encouraging reports from their mines and smelters, and say town lots are on the rise in the coming city of Stoddard.

WHITE HILLS.—Kingman *Miner*, Oct. 15: There are now over 100 men in the White Hills regularly employed in the mines, besides the many miners working on leases. The camp is looking better and more lively every day. Much work is being done on the Horn Silver mine at White Hills. The shaft is down 60 feet in the same grade ore as on the surface. The mine is one of the bonanzas of the camp, and with a mill in the camp would yield big money to the owners. The ore is free-milling, and the entire ledge will average over 100 ounces per ton. The G. A. R. mine, at White Hills, is daily proving itself a bonanza. At a depth of 100 feet the ore is much richer than on the surface, and the vein much wider. The two shafts were connected at a depth of 70 feet for the purpose of obtaining a good circulation of air, and now that this has been accomplished the main shaft will be sunk down as fast as possible. There are two other shafts on the ledge down about 80 feet that show the same high-grade ore as in shaft No. 1, being sunk by sheriff Lake, from which a great deal of ora is being taken. The mine can ship four or five carloads of ore per day, should the owners so desire. The many leasers on the Prince Albert mine, at White Hills, are making money. The leases extend to a depth of 50 feet, and so far as sunk on the ledges show up very rich ore. Conkey and Tyler have a fine showing near the apex of the hill on a small ledge and have considerable on the dump.

OLD WOMAN'S MOUNTAIN.—Kingman *Miner*, Oct. 15: Thomas Burke and John Jimmison

are in town from Old Woman's Mountain. They brought in a ton of ore from a claim owned by "Bannock" Kimberly and the latter gentlemsn, to be sampled. The ore is said to be exceedingly rich in free gold and silver, and the property from which the ore is taken is claimed hy competent judges to be ons of the best prospects in Scanlon district. They expect to return in a few days and open up the mine in good shape.

AUABEY DISTRICT.—From present indications, it would seem that considerable mining is being contemplated in Aubrey district this winter. W. D. McCright, of Signal, intends moving his little mill from the Burro mine, near some clsims owned hy him in the region near Groom's Peak, and a wagon road is now under course of construction from tbese mines to the big Sandy. Quite a nnmber of men are at work on the mines, and in nearly every instsnce are taking out ore of exceeding richness. The main sbaft on the Schaefer Treasnre is now down a depth of 80 feet, and shows rich ore the whole distance. At the bottom there is a four-foot ledge of high grade ore, while the vein matter is six or seven feet in width. Depth bnt adds to the richness and extent of the ore body in the mine. It will be thoroughly exploited this fall and winter.

FLORES MILL.—Twiggs & Co. havs finished their millrun at the Flores mill. Over 600 tons of ore was run throngh, from which a hig cleannp was made. Nearly 100 tons of concentrates were obtained running high in hase metal and containing $100 in gold and silver to the ton. This mill conld be kept running for years on the same cbsracter of ore by these gentlemen and made to pay handsomely.

WEAVER DISTRICT.—James Smitb came in from his camp north of Weaver district yesterday. He reports that work on the tunnel on tbe Horn Silver mine is being pushed, and that ore shows up in the face the entire width. Tons of rich mineral is being piled up on the dnmp and made ready for shipment to the sampler.

INDIAN SECRET.—Men are working all over the small, rolling hills of Indian Secret district, singly and in pairs. The many little ledges showing rich mineral are receiving the attention of the chloriders in camp. Many of the boys are making considerahle money and opening the ledges up in good shape. The Black Canyon range of mountains is receiving the attention of miners and prospectors. On tbe west side of the Detrital valley quite a camp bas been started and a new district will soon he fonnd. Many valuable locations of gold and silver have been made and prosperity reigns supreme.

MONTANA.

ANACONNA.—Butte *Inter-Mountain*, Oct. 12: The shaft of the Anaconda mine reached the 1100-foot mark this morning, and it is nnderstood sinking will he continued to the 1500-foot level. The work of cutting a station at the 1100-foot level will be commenced next week. The sha't is a three-compartment, 22x10 feet, outside measnrement. An important change recently made at the mine is in the matter of pumping the water from the mine. A tunnel has heen run from the 300-foot level to a point near the Parrot tramway. The discharge pipe of the pumps will he conducted along this tunnel, discharging the water into a ditch which will convey it to the creek near the Parrot amelter. By this method the loss occasioned by pumping the water tbe additional 300 feet to the surface will be entirely obviated. The Never Sweat mine, one of the Anaconda properties, is in active operation. At present a station is being cut at the 500-foot level and it is understood that the shaft will he developed at once at least another 100 feet. For this purpose, additional machinery capahls of thoronghly developing the property will be placed in position. It is understood that the engine ordered is the same size as the one at the Anaconda mine.

NEW PLACER DIOGINOS.—Some rich placer gronnd has heen discovered during the past few weeks away up on Lost creek. The locality is one that heretofore has been practically unexplored, a trail through the tbick timber having only recently heen made. Tbe locality is ahout three and one-balf miles beyond the Silent Treasure mine. Onslow Peters and others have located about 4200 feet of claims and taken up 600 inches of water right. They are elated over the new diggings, which show an ahnndance of black sand that sparkles with color and carries precious stones- Some of this black sand, washed from a pan of dirt, was brought to Butte during the week and assayed. It carried $380 in gold to the ton. Mr. Peters says there is a great abundance of this sand and he thinks he has struck a veritable bonanza in placer diggings. Water is ahundant and can easily he conveyed to the claims. He says there is still plenty of ground left beyond his locations.

THE ST. LAWRENCE.—At the St. Lawrence mine work was resumed last Monday and at present tbe force of miners employed is greater than at any previous period. The miners state that the levels are entirely free from foul air. This result was accomplished by conducting a ten-inch galvanized iron pipe down the pump shaft from the surface to the 600-foot level. A steam pipe was also run to the 100-foot level, and a jet of steam was allowed to enter the air pipe. The jet of steam causes a suctiod in the air pipe, which draws all tbe gases from the lower levels.

A NEW SMELTER.—Heinze & Giffard, wbo have a lease on the Stella and Oneida, are superintending the erection of a small smelter near the Liquidator mill. The smelter is being erected by eastern capitalists and will contain, when completed, two blast furnaces and one reverbatory. It will be in operation about the middle of Decemher, and besides the treatment of Oneida and Stella ores, custom ores will be treated.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WAAK ENDINO OCT. 11, 1892.

484,172.—BEE-SMOKAR—G. W. Brodbeck, Los Angeles, Cal.

484,292.—MUSIC-LEAF HOLDAA—A. O. Brown, S. F.

483,993.—RAIL JOINT—W. Curtis, Oakland, Cal.

484,144.—TUAULAA METALLIC POLA—D. Dorward, S. F.

484,149.—SASH FASTANAR—C. S. Fay, S. F.

484 190.—HOSA-BANN—Geo. Ferguson, Los Angeles, Cal.

484,313.—SHOE FASTANER—Hamill & Johnson, Glohe, A. T.

484,199—ELECTAIC-ARC LAMP—J. A. Hayes, Carson, Nev.

484,154—FRUIT-PITTAR—G. C. Howell, Alameda, Csl.

484,216.—HORSE-TAMING APPARATUS—Rslph Mszza, Niles, Cal.

484,223.—AUXILIARY VALVA FOR ELAVATORS—A. J. McAdam, S. F.

484 221.—ROSETTA-TURNING CUTTER HEAD—R. B. Moore, S. F.

484,335.—SUSPENSION HOOK—G. A. Moss, S. F.

484,231—RATCHET DAILL BRACE—W. P. Nolan, S. F.

484,235.—SASH FASTENAR—J. C. Plunkett, Oakland, Cal.

484,237.—KILN—Wm. Rsdford. San Joss, Csl.

484,239—CULTIVATOA—C. C. Reynolds, Kelseyville, Csl.

484,163—SAWTOOTH SWAOE—W. W. Ryder, Alsea, Or,

484,249.—WOODEN LIQUID CONTAINING VESSEL—J. M. Schofield, Merced, Csl.

484,053—HAMA CLIP—James Scott, Betbany, Cal.

484,378.—FIFTH WHEEL—S. H. Sexton, Tucson, A. T.

484,260.—FIAA ESCAPA—P. B. Sullivan, Tuscarora. Nev.

484,379.—SHAEP-SHEAAS—J. D. Todd, Chico, Cal.

484,349.—BOOKBINDINO—Dan'l Waide. S. F.

484,169.—FORCE PUMP—M. L. G. Wheeler, North Yakima, Wash.

484,074.—LAWN SPAINKLER—D. C. Wilgus, Los Angeles, Cal.

21,887.—DASION FOR ENOINA FRAME—Dan'l Best, San Leandro, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ELECTRO-THERAPEUTICAL INSTRUMENT.—Jas. W. Moliere, S. F. No. 482,745. Dated Oct. 4, 1892. The object of this invention is to provide an apparatus for the production of ozone and a means whereby it may be directly inhaled by the person desiring to nse it, and in conjunction therewith of a means for applying a current of electricity. Ozone is readily developed hy the action of static electricity and may be developed by machines constructed for the pnrpose. The ozone is, however, to a great extent wasted in the ordinary arrangement of snch machines, and this apparatns is designed to overcome this difficulty.

APPARATUS FOR MAKINO MALT.—Wm. A. Peters, S. F. No. 483,748. Dated Oct. 4, 1892. This apparatus consists of a casing in whicb is a series of revolving open work or foraminous cylinders. Connected with the casing is a vessel which is itself connected witb a steam-pipe and with an airblower or fan. Under the casing is a drying-kiln having within it a series of open-work cylinders, caused to revolve by suitahle means. The operation carried on in this apparatus is briefly as follows: The barley is steeped in the tanks in the usual manner. It is then supplied to the cylinders in the casing, and hy their rotation it is thoroughly and regularly stirred. The cold air forced into the vessel to which steam is supplied condenses the steam and the mo'sture-laden air is allowed to enter the casing, wherein it keeps the barley properly moist. When sufficient growth has been obtained the malt is discbarged into the cylinders in the kiln, wherein it is constantly agitated and subjected to the drying action of the heated air in the kiln.

MACHINE FOA GAOOVING SHOE-SOLES.—George Bryant, S. F. No. 483,319. Dated Sept. 27, 1892. The object of this machine is to form grooves or cbannels upon the surface or surfaces of soleleather and transversely with the soles at that part where they cross the ball of the foot.

HARNESS-SADDLE PAD.—Russell Whitman, Oakland. No. 483,754. Dated Oct. 4, 1892. In the construction of harness-saddles it is customary to make them with pads permanently and rigidly fixed under the saddle upon each side of the center, these pads being adapted to rest on the back of the horse, on each side of the backbone or withers, so as to protect the latter from injury by the saddle. The back-straps are also attached to the saddle or extenaions therefrom. In this improvement I employ independent, flexibly-connected, snpplemental pads, which are removably attached beneath the main harness-saddle with means for allowing a rocking motion, wbich makes the pads self-adjustable and they will fit themselves to the sbape of the horse's back. The back-strap also passes through the saddle with a freedom which allows side movement to adapt it to irregnlar strains upon the shafts, which wonld otherwise tend to pull the saddle from sids to side and chafe the animal's back.

LATCH AND LOCK COMBINEN.—John E. Armstrong, Santa Cruz. No. 483,318. Dated Sept. 27, 1892. This invention consists of a peculiarly constructed door lock, having a reciprocating latch bolt, and a knob spindls which is adapted to be both turned axially and movable longitudinally, so that whsn in ons position it will freely operate the latch and when in another position it will not do so. In conjunction with this is a spring-controlled catch which engsges and locks the catch when desired so that the latter cannot he moved, and a peculiarly formed key and key-way are employed with other devices to increase the safety of the lock.

HORSE-TAMING APPARATUS—Ralph Mszza, Niles, Alameda Co. No. 484,216. Dated Oct. 11, 1892. This is an apparatus to be used for making horses, mules, oxen and otber animals tams and gentle. It consists of a padded box or stall of sufficient size to contain the horse or other snimal, and mounted upon a vertical axis so that it can be rotated. The idea is, before the horse is harnessed or bridled, tbat he may be reduced to snch a condition that this may be done before the animal is able to protest by any of the nsual means adopted by animals. When the horse becomes vicious or intractable he is led or driven into the box, which is then rotated upon its vertical axis with as mnch speed and for as many revolntions as may be found necessary. This varies with different animals. Soms are made so dizzy as to fall down after a few revolutions, while others cannot hs overcome until ths apparatus hss been rotated a number of times snd at considerable speed. The inventor says that by this operation ths animal will bs rendered so docile that it can bs harnessed, attached to ths cart, and driven with little difficulty. The apparatus enables the operator to tams an animsl and render him gentle without any violent or cruel treatment.

ROSETTE-TURNING CUTTER-HEAD—Robert B. Moore, S. F. No. 484,221. Dated Oct. 11, 1892. Tbis invention relates to a head to hold cutters for turning rosettes in wood such as are employed for ornamental finishing for door and window casings and for other purposes. Heretofore, it has heen customary to form the cutterhead witb two oppositely-disposed radial plates upon whicb the cutting-knives of any desired shape are secured. With this construction, especially where aoft wood is heing employed, a large percentage of the pieces are spoiled hy the tearing of the wood where a head is formed. Tbis objection is overcome by the new device, and peculiar knives are so set with relation to each other as to maintain tbe same-sized cut and shape at all times.

FIRA-ESCAPA.—Philip B. Sullivan, Tuscarora, Nev. No. 484,260. Dated Oct. 11, 1892. The invention consists in oppositely reciprocating cages fitted and moving in suitable guides in or on the huilding, a winding-drum situated on the ground below, a brake-mechanism for controlling the movement of said drum, a cable wound in opposite directions ahout the drum and having its ends secured, one each to a cage. The object of the invention is to provide a fire-escape, the operation of whicb is due wholly to the weight of the loaded cage, wbich not only carries down its own passengers, but at the same time elevates the empty or partially empty cage to position to receive other passengers, whose weight in turn will elevate the first cage after the latter has been relieved of its passengers. The whole device is nnder control of the operator on the sidewalk who manipulates the brakes.

BOOK OR MUSIC LEAF HOLDER.—Alexander O. Brown, S. F. No. 484 292. Dated Oct. 11, 1892. This invention consists of a clamp-plate adapted to be readily attacbed to the edge of the leaf and a finger-catch ring carried by the plate. The invention further consists in the peculiarity of the attachment of said ring to the clamp-plate whereby tbe ring will remain in a position in wbich it can be most readily engaged by the finger to turn over the leaf.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

SAN LUIS OAISPO CHAOME COMPANY, San Luis Obispo. Capital stock, $25,000. Directors—Robert E. Jack, W. L. Beebee, H. G. Sbaw, M. Goldstein and W. I. Bevan.

THA WHEELER MANUFACTURINO CO. Capital stock, $100,000. Directors—R. N. Simpson, E. H. Gould, R. Wheeler, Chester Deering and C. H. E. Hardin.

LUCKY HORN MININO CO. Capital stock, $100,000. Directors—J. J. Haley, A. S. Moore, G. W. Horn, W. H. Worden and William Jeffray.

CENTRAL AMERICAN STEAMSHIP CO. of San Francisco. Capital stock, $1,000,000. Directors—H. P. Squire, F. M. Crawford, M. I. Crawford, F. S. Stratton and F. W. Leavitt.

POAT OF TRIUNFO WHARF ANN LIOHTERAOE CO. Capital stock, $100,000. Directors—H. P. Squire, F. M. Crawford, M. L. Crawford, F. S. Stratton and F. W. Leavitt.

SAN FRANCISCO SMALTINO AND REFINING CO. Capital stock, $300,000. Directors—Albert H. Stone, Richard Stege, George W. Dornin, M. H. Gilson, Edward F. Stone.

BISHOP CONS. M. AND M. CO. Capital stock, $40 000. Directors—L. Farr, Walter G. Manuel, J. A. Chestnut, Jr., E. W. Moody and Ernest D. Williams.

Mining Share Market.

SAN FRANCISCO, Oct. 19, 1892.

Mining shares the past week under review were only fairly active, witb the public generally selling under a well-executed break in the middle and north end shares. Shares in the first group declined, under the lead of Hale & Norcross, and in the last group under the lead of Con. Virginia. It is unnecessary to say that the decline was planned and the manipulation done by the mill rings to get in shares all along the line—which they succeeded in doing—by demoralizing the public during the break through false reports of the work under way in the mines having proved a failure and that Con. Virginia would levy an assessment. It is needless to say that members of the mill rings, their camp followers and their leading broker, Bob Morrow, only regret that no development of ore can be made. "If we can only find a bndy of ore," is the refrsin which is now parroted by the reported organs of the mill rings. What has become of the reported rich nre in Belcher, Con. Virginia and two other mines, which was used to aid in promoting the small deal last month? The ore development, it is safe to say, answered the purpose, and was lost to sight when the market broke and it was necessary to squeeze the last share possible from disgusted and demoralized outsiders. What the next upmove will be made on it is hard to say, yet the rings can be trusted to get up a plausible story; but it is doubtful if they will be successful in getting only those in the market who buy only to sell when a profit is in sight. As long as this class, and not monied outsiders, deals in shares, the upmoves will be treacherous and should be taken advantage of to sell by all who have been lured into the net. It is time enough to deal in shares when *all* the bullion is turned over to the companies and the mines worked and the ore milled to conform to the law under which the companies were incorporated. Under the present system of working the mines, and milling ore, the only thing that outsiders get is assessments, while the rings get the bullion. It is a great game this of working the Comstock mines, the tricks in which it is doubtful if even a highwayman would stoop so low as to play.

At the annual meeting of the Con. Virginia Mining Co., the Mining Stock Association filed a protest against the manner in which the mine has been worked, and demanded that certain specific reforms be instituted. Is it not about time that the Association takes stronger and more aggressive measures to bring about the long-desired reform in the management of the Comstock mines, so that all the bullion extracted from the ore, slimes or tailings be turned over to the companies and not, as is contended, misappropriated? The late J. C. Flood, if we are correctly informed, was made to refund to a mining company on the Comstock about $800,000 or take the consequences. Of course he preferred doing the former. Why is not the same course pursued now? Is it not about time to cry "Halt!" and force the mill-rings and their dummy directors to pursue such a course that there will not be occasion for even suspicion of collusion by which shareholders are defrauded of their proportion of bullion produced by the mines? If we mistake not, the members of the Mining Stock Association stand where the writer does, viz., turn all bullion over to the mining companies, and then the fight against members of the rings will be stopped. It is a simple proposition, and if honest management is to be the watchword, such a course should be pursued. If this is not done, then criminal proceedings should be instituted against the directors of the mines that it is contended are being looted.

Reports are current that the price of leading shares must go off about 20 per cent before it is safe to buy for the coming deal. Whether these reports are correct we do not know, but it is quite a safe proposition for those who operate in shares to sell if there is an upmove between now and election, but to hold if prices are not advanced. If there is not a deal now there will unquestionably be one after the election, but if there is one now then it is hardly reasonable to look for another this year. While believing in another upmove, yet we again warn patrons against the game as long as it is bullion for insiders and assessments for outsiders.

Prudent and reliable advices from the Comstock mines are of a far more encouraging character than at any time this year, but appear to be suppressed by the mill rings, probably for more successful mine-looting. In Belcher, while the developments do not warrant high figures for the shares, they justify higher prices than now rule, *provided* the ore is to be honestly milled. In Hale & Norcross the work is very important, but it is made to look like a failure. In running west, work is invariably stopped when the lode is reached. Why is this done? It looks as if the lesson in the Hale and Norcross suit were not enough. If this is so, why are not criminal proceedings instituted or the mine placed in the hands of a receiver. In Con. Virginia, it is said, they will soon begin stoping rich ore to the west. In Ophir and Mexican, important work is under way as is that in Sierra Nevada, but whether outsiders who do not sell their shares if prices go up, will get more than assessments is rather doubtful. The increased flow of water in the Carson river has admitted of the mills starting up.

This (Wednesday) afternoon the hear raid which was announced yesterday was continued with the entire line sold down. The prices at which shares sold nearly covered the 20 per cent decline which had been expected. It is now asserted that the margins will be cleaned up by to-morrow, and that some time in next week the rings will be ready to start the deal. Advices from the Comstocks report that in Belcher they expect to strike during the recess the ore which they have been running for on the 400 level. Probably it was the certainty of finding this ore which caused such strong hear talk by brokers, cappers and writers, and also hear writing in two of the daily papers. It is a great game this of working the Comstock mines.

Market Reports.

Market Review.

SAN FRANCISCO, Oct. 19, 1892.

General trade was only fairly active the past week. There is still considerable winding up of accounts, but, as a rule, the list is far short of previous years. The conservatism in trade continues to prevail in all branches, and it is to this that must be largely attributed the seeming inactivity in the markets. Buyers for large houses in the interior say that their purchases aggregate considerably more than they did at the corresponding dates in either 1891 or 1890, but while saying this they state that the purchases do not indicate more than assortment stocking. This statement is emphasized by an almost entire absence of speculation in certain lines, the statistical situation of which warrants, on its face, much better prices than now obtain, but it is being conceded that business, backed by increasing confidence, is working into a better position when speculative movements will largely prevail. When the latter does come to the front, much more prosperous times will be assured. If the old saying that "iron is the barometer of trade" still holds good, then the turning point has been reached, for the market for pig iron is gradually strengthening at the East under an enlarging and steadily growing consumption. The increasing demand for pig iron appears to come mainly from plants which are owned by or have close connection with rolling mills and steel plants. This indicates that the railways are to be heavy buyers of rails and rolling stock. For fully two or three years they appeared to have confined their purchases, but necessity evidently forces them to make extensive repairs and improvements.

The local money market continues in an anomalous condition. While banks report the reserves larger than usually carried, yet the most of them claim that the market is working close. Be this as it may, yet we are informed by leading business men that they have no difficulty in securing accommodations at previous rates of interest. Call or short-timed paper finds ready acceptance, but term paper is closely scrutinized and not desirable, particularly when the time for annual and semiannual dividends and disbursements is so near at hand. There is another factor, viz., the uncertainty regarding what action will be taken by the International Monetary Conference on the silver problem, and until the conference meets and definite action taken, there will prevail more or less uneasiness. It is contended by the better-informed financiers that if the conference will act favorable to bimetallism, then a new era of prosperity in an enlargement of speculative and industrial pursuits is assured; but if the conference should be unfriendly to bimetallism, then the future would be clouded in uncertainty and an era of general disturbances and financial and commercial disasters be ushered in. This opinion is grounded on what the PRESS has contended, that further action by European powers against silver would bankrupt the many consumption countries, whose monetary currency is silver and thereby precipitate a crisis which would bring ruin to those countries which are large suppliers of commodities required. Writing as to the situation, Cordley & Co. of New York says:

An early date has been set for the convening of the International Monetary Conference, and there are many indications that the British Government, while itself strongly opposed to taking any action looking to universal bimetallism, is being forced by the mercantile and manufacturing interests of Great Britain to give the matter something more than the cursory attention it had first intended. It is therefore reasonable to hope for international bimetallism. The only fear is that the intense opposition to it in the inner circles of the present English Government will postpone the matter until after it is forced by an acute crisis. While many have looked for such a crisis in this country, a very careful canvass of the situation leads us to think that England will suffer first and most.

SILVER—The market advanced the past week both at home and abroad, but yesterday prices shaded off. The advance and decline show that the metal is still under speculative influences and that the price is controlled largely by the reported syndicate interest in securities and commodities whose market value is governed by that of silver. There was exported by sea the past week $49,640 in bullion to China and $69,000 to Japan.

MEXICAN DOLLARS—The exports by sea the past week aggregate as follows: To China, $911,697, and to Bombay $13,500. This is the largest aggregate shipment made at any one time within the past two years. The advancing tendency of silver no doubt caused the increased demand. The market is steady at around 67½ cents.

QUICKSILVER—Receipts the past week aggregate 460 flasks, and exports by sea 50 flasks to Mexico. The home demand has been fair. The market is barely steady.

COPPER—The market has held to fairly firm prices. The strength of the market has given rise to reports of another combine. While advices received indicate that amicable arrangements have been made with Haggin, yet they do not warrant the assertion that a combine has been formed. The advance was largely due to larger consumptive buying and lessened stocks. London cables under date of Oct. 13 report as follows: "In the copper market there is a more cheerful feeling and prices have advanced quite sharply. Reduced supplies impart some confidence, but the market has gained more support from heavy buying by leading firms, together with freer buying by leading operators. There has been a good inquiry from India, and home consumption is better. Furnace material is at present sparingly offered."

COAL—Imports the past week aggregate as follows: Coos Bay 450 tons, Nanaimo 8523; Tacoma 4700; Seattle 7279; Departure Bay 7200; Swansea 3290; Liverpool 3445; Cardiff 3168. Total 38,055 tons. The market while reported strong for Australian does not show any change in quotations. The imports the past week were quite large, particularly of coast. The demand continues disappointingly light. Australian freights are reported higher.

PIG IRON—The market while not quoted higher appears to have a hardening tendency. New York *Iron Age* says: While there has been an increase in the capacity of the blast furnaces working from 151,648 tons weekly on September 1 to 158,027 tons per week on the 1st of this month, this has been more than offset by a decrease in the stocks during the month of not less than 82,000 tons. The increase in the output has chiefly taken place among those plants which are owned by or have close relations with rolling mills and steel plants. Foundry and forge irons, and particularly the former, are unquestionably firmer in all markets, but is evident that in the West at least the attitude of sellers is to be tested by a period of dullness.

BORAX—Receipts the past week aggregate 220 cks., and exports by sea 1050 cks. to New York. The market is steady at current quotations.

LIME—Receipts the past week aggregate 2806 bbls. The demand is only fair, with quotations given at $1.25@1.50 per bbl.

ANTIMONY—The market is weak at quotations. New York mail advices quote that market as follows: 10½@10¾c for Hallet's; 11c for LX; 11¼c for Crown and 11½@11¾c for Cookson's in round lots.

PIG LEAD—The market is slow. Eastern mail advices report that the production appears to be steadily gaining on the consumption, and consequently buyers are only induced to operate freely by concessions.

PIG TIN—The market is only moderately supplied, but this is neutralized by an offish demand. At the East there appears to be another bull campaign under way. The manipulators appear to be moving cautiously as yet. Consumers do not take beyond near-by wants.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb..... — @	13½	English, lb..... — @	18
BORAX.		Canton tool..... — @	8½
Refined, in car lots — @	7½	8l'k Diam'd tool	8½@ 15
Powdered, do... — @	7½	Pick & Hammer.	9½@ 10
Concentrat'd, do — @	8¾	Machinery..... 4 @	5
All grades jobbing at advance.		Toe Calk..... — @	4½
COPPER.		**TINPLATE.**	
Bolt..... 22 @	—	B. V. steel grade	
Sheathing..... 22 @	—	14x20, spot.... — @	5 87½
Ingot, jobbing.. — @	14½	Charcoal, 14x20. — @	5 87½
Do, wholesale.. — @	13½	Do roofing, 14x20 — @	5 87½
Fire Box Sheets 22 @	24	Do, do, 20x28.... — @	11 75
IRON.		**PIG TIN.**	
Bar, base..... — @	3	Spot ₩ lb..... — @	23
Norway, base... — @	4½	**COAL.**	
PIG IRON.		SPOT FROM YARD—PER TON.	
Spot.		Wellington.....	$8 00
Eglinton ₩ ton...22 00@—	—	Greta.....	7 50
Glengarnock....23 00@—	—	Nanaimo.....	5 50
Am. Soft, No. 1..24 00@—	—	Gilman.....	5 00
Oregon Pig..... —@—	—	Seattle.....	6 00
Puget Sound..... —@—	—	Coos Bay	5 50
Clay Lane White..24 00@—	—	Cannel.....	8 50
Langloan.....22 00@—	—	Egg hard.....	12 00
Thorncliffe.....23 00@—	—	Cumberland, in sacks...	15 50
Gartsherrie.....22 00@—	—	Do, bulk	14 00
Barrow.....22 00@—	—	Wallsend.....	7 25
Carnbroe.....22 00@—	—	Scotch Splint.....	7 50
CHROME IRON ORE.		Brymbo	7 50
Per ton.....10 00 @—	—	West Hartley.....	7 50
LEAD.		TO LOAD—PER TON.	
Pig..... — @	4½	Australian.....	5 00@—
Bar..... — @	5½	Liverpool Steam .	8 25@—
Sheet..... — @	7	Scotch Splint...	5 25@—
Pipe..... — @	8½	Cardiff.....	5 50@—
SHOT.		Lehigh Lump....	15 00@—
Drop, sizes *smaller* than		Cumberland.....	13 00@—
B, ₩ bag of 25 lbs.....$1 85		Egg, hard.....	11 00@—
Do do, B and *larger* sizes		West Hartley.....	7 00@—
₩ bag of 25 lbs 2 10		**COKE.**	
Buck, Balls and Chilled		English, to load...$8 00@	9 00
do, ₩ bag of 25 lbs..... 2 10		Do, spot, in bulk.— —@	10 00
QUICKSILVER.		Do, in sacks..... — —@	12 00
Home trade, pr.		Cumberland..... 9 00@—	—
flask .....41 00 @41 50			
For export..... 35 00 @35 50			

Eastern Metal Markets.

NEW YORK, Oct. 18.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday.....	38½	84½	11 65	3 95	20 75
Friday.....	39¼	85½	11 60	3 90	20 75
Saturday.....	39¼	86½	11 60	3 90	20 75
Monday	39½	86½	11 50	3 90	20 87½
Tuesday	39½	85½	11 50	3 90	20 70
Wednesday	...	...	.....	....	.....

The market has been active for horax at steady prices. Quicksilver is easy. Pig iron is strong. Tin is fairly steady. Copper is firm at current quotations. Lead is barely steady.

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ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Alpha Con M Co, Nevada	9	10c	Sept 2, Oct 6, Oct 27		C E Elliott, 309 Montgomery
Brunswick Cons G M Co, California	4	2c	Sept 29, Oct 31, Nov 17		J Stadtfeld Jr, 309 Montgomery
Commonwealth Cons M Co, Nevada	9	10c	Sept 7, Oct 14, Nov 9		R R Grayson, 336 Pine
Cons Pacific M Co, California	14	10c	Sept 29, Nov 5, Nov 30		F E Luty, 330 Pine
Cons St. Gothard M Co, California	6	5c	Oct 13, Nov 17, Dec 7		T Wetzel, 329 Sansome
Crown Point M Co, Nevada	53	25c	Sept 15, Oct 20 Nov 10		J Newlands, 331 Pine
Darbee Blue Gravel Co, California	10	10c	Sept 14, Oct 17, Nov 7		T Wetzel 329 Sansome
Eureka Con Drift M Co, California	5	10c	Sept 19, Oct 24, Nov 14		D M Kerr, 330 Pine
Evening Star M Co, California	5	20	Oct 10, Nov 19, Nov 29		J J Scoville, 329 Sansome
Golden Fleece Gravel M Co, California	18	33	Oct 10, Nov 16, Dec 7		W J Gleason, Phelan Block
Gray Eagle M Co, California	30	5c	Sept 28, Oct 31, Nov. 21		A W Barrows, 303 California
Inyo Marble Co, California	18	50c	Sept 7, Oct 22, Dec 1		A F Thane, 137 Montgomery
Jack Rabbit M Co, Nevada	1	5c	Sept 17 Oct 19, Nov 8		T Wetzel, 329 Sansome
Justice M Co, Nevada	54	1c	Oct 14, Nov 18, Dec 8		R E Kelley, 419 California
Kentuck Cons M Co, Nevada	5	10c	Oct 3, Nov 8, Nov 29		J W Pew, 310 Pine
Mexican M Co, Nevada	40	25c	Oct 13, Nov 17, Dec 7		C E Elliott, 309 Montgomery
Mono M Co, California	32	25c	Sept 15, Oct 24, Nov 14		H D Walker, 3 9 Montgomery
North Belle Isle M Co, Nevada	20	10c	Sept 1, Oct 8, Nov 7		J W Pew, 310 Pine
Northwestern G M Co, British Columbia	6	20c	Aug 17, Sept 25, Oct 15		F Donaelns, 438 California
Overman M Co, Nevada	65	30c	Oct 5, Nov 10, Nov 30		G D Edwards, 414 California
Savage M Co, Nevada	79	10c	Oct 7, Nov 9, Nov 29		E B Holmes, 309 Montgomery
Silver King M Co, Arizona	9	25c	Aug 26, Oct 7, Nov 4		J W Pew, 310 Pine
Yellow Jacket M Co, Nevada	52	25c	Sept 5, Oct 7, Nov 11		W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Alpha Cons M & M Co, Nevada	Annual	C E Elliott, 309 Montgomery	Oct 25
Hollingwood M Co..	Special	F E Luty, 330 Pine	Oct 31
Tepezella Copper M Co	Annual	J W Pew, 310 Pine	Oct 25

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	5	L Osborne, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Cons Cal & Virginia M Co	50	A W Haven, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Oct 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

State Game and Fish Laws.

In Effect May 17th, 1891, and Until Further Notice.

The Acts relative to game and fish, as amended by the last Legislature, are as follows:

Every person who, in the State of California, between the first day of March and the first day of October of each year, hunts, pursues, takes, kills, or destroys any quail, partridge, or grouse, or any kind of wild duck or rail, is guilty of a misdemeanor.

Every person who, in any of the counties of the State of California, at any time, takes, gathers or destroys the eggs of any quail, partridge, or grouse, or mallard duck, or any kind of summer duck, red head, teal, or any gray duck, or any other kind of wild duck, is guilty of a misdemeanor.

Every person who, in the State of California, between the first day of January and the first day of July in each year, hunts, pursues, takes, kills, or destroys doves, is guilty of a misdemeanor.

Every person who, in any of the counties of the State of California, hunts, pursues, takes, kills, or destroys any male deer, antelope, mountain sheep, or buck, for the period of two years from the date of the passage of this Act, is guilty of a misdemeanor.

Every person in the State of California who has in his possession any green hides or any green skins of any deer, elk, antelope, or mountain sheep, killed after the passage of this Act, and before the expiration of two years from the passage of this Act, is guilty of a misdemeanor.

Every person in the State of California who, at any time, hunts, pursues, kills, takes, or destroys any female deer, antelope, elk, mountain sheep, or doe, shall be guilty of a misdemeanor.

Every person who shall at any time hunt, pursue, take, kill, or destroy any spotted fawn, is guilty of a misdemeanor.

Every person who shall take, kill, or destroy any of the animals or birds mentioned in this section, at any time, unless the carcass of such animal or bird is used or preserved by the person taking or slaying it, or is sold for food, is guilty of a misdemeanor.

Every person who shall buy, sell, offer, or expose for sale, transport, or carry, or have in his possession, any deer or deer-skin, or any hide or pelt from which the evidence of sex has been removed, or any of the aforesaid game, at a time when it is unlawful to kill the same, as provided by this and subsequent sections, is guilty of a misdemeanor.

Every person who takes, catches or kills, or exposes for sale, or has in his possession, any speckled trout, brook or salmon trout, or any variety of trout, between the first day of November and the first day of April in the following year, except salmon trout taken with rod and line in tide water, is guilty of a misdemeanor.

Fishing for salmon, shad, etc., between six o'clock Saturday evening and sundown of succeeding Sunday prohibited.

Fishing by explosives, or by pound, weir, cage, trap or set net, prohibited.

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Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 28.		WEEK ENDING Oct. 5.		WEEK ENDING Oct. 12.		WEEK ENDING Oct. 18.	
Alpha	.30	.50	.30	.40	.35	.50	.30	.50
Alta	.40	.55	.30	.50	.35	.50	.30	.40
Andes	.55	.90	.55	.75	.70	.80	.50	.70
Belcher	3.10	8.50	2.95	4.50	3.10	4.25	3.10	3.95
Belle Isle	.15	....	.15	....	*.15	....	.19	....
Best & Belcher	2.65	3.30	2.00	2.90	2.25	2.45	1.75	2.25
Bullion	.65	.95	.60	.75	.60	1.05	.70	.90
Bodie Con	.45	.60	.25	.40	.30	.35	.30	.40
Bulwer	.35	.50	.35	....	.30	....	....	....
Commonwealth	.05	....	.05	....	.10	....	....	....
Con. Va. & Cal	3.65	5.00	3.80	4.50	4.00	4.45	3.45	4.05
Challenge	.70	1.50	.80	1.05	.90	1.15	.80	1.15
Choller	1.00	1.60	.80	1.40	.95	1 30	.80	1 10
Confidence	3.00	3.50	1.85	2.50	2.15	3.00	2.00	2.60
Con. Imperial	.10	....	.05	.10	.05	....	.05	....
Caledonia	.30	.45	.20	.30	.20	.35	.20	.25
Crown Point	1.20	2.25	1.45	1.65	1.15	1.60	1.15	*1.40
Cocker	.10	....	....	....	....	....	.10	....
Del Monte	....	....	.05	....	....	....	.05	.10
Eureka Con	1.90	2.00	2.00	....	....	....	....	....
Exchequer	.30	.40	.20	.30	.30	.40	.20	.30
Grand Prize	....	....	....	....	....	....	.10	....
Gould & Curry	1.30	2.00	1.15	2.00	1.35	1.55	1.35	1.40
Hale & Norcross	2.30	4.15	2.15	3.50	2.05	2.30	1.50	2.10
Julia	.10	.20	.10	.15	....	....	....	....
Justice	.30	.45	.20	.35	.25	.30	.10	.25
Keotuck	.25	.40	.15	.30	.20	.30	.15	.25
Lady Wash	.15	.23	.10	.15	.10	.15	.10	.15
Mono	.20	....	.15	....	.10	....	.10	*.30
Mexican	1.80	2.80	1.80	2.40	1.85	2.10	1.60	1.85
Navajo	.15	....	.15	....	....	....	....	....
North Belle Isle	.05	....	.05	....	*....	....	.10	....
Nev. Queen	.15	....	.10	.15	.10	....	.10	....
Occidental	.40	.55	.30	....	.30	.35	.25	.30
Ophir	2.95	4.05	2.75	3.40	3.00	3.30	2.55	3.10
Overman	.70	1 65	.70	1.15	.70	1.00	.55	.80
Potosi	.95	1.70	.80	1.45	.95	1.45	1.00	1.20
Peerless	.10	....	.05	.10	.10	....	.10	.15
Peer	.15	....	....	.20	....	....	.30	....
Savage	1 30	3.00	1.50	2.50	1.30	1.75	1 00	1.30
Sierra Nevada	2.30	3.00	1.90	2.50	2.00	2.30	1.70	2.05
Silver Hill	.20	.35	.20	.25	.20	.25	.15	.20
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.55	2.15	1.25	1.85	1.55	1.70	1.25	1.55
Utah	.35	.50	.30	.45	.30	.35	.20	.30
Yellow Jacket	1.00	1.85	.80	1 35	*1.10	1.60	1.30	1.60

*Assessment added.

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W. H. MURRAY—California.
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STOCKHOLDERS' MEETING.

Offine of the Superior Mill & Mining Co.

Notice is hereby given that a meeting of the stockholders of the Superior Mill and Mining Company will be held at the Office of the Company, No. 303 California street, Room 11, on Saturday the 29th day of October, 1892, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors until the next annual meeting, and for the transaction of such other business as may come before the meeting.

The Annual Election, not having taken place at the time appointed, and no call therefor having been made or published, and the Corporation having no Secretary, this meeting is called and notice thereof given to the Stockholders by the President of the said Corporation.

D. L. MUNSON, President.

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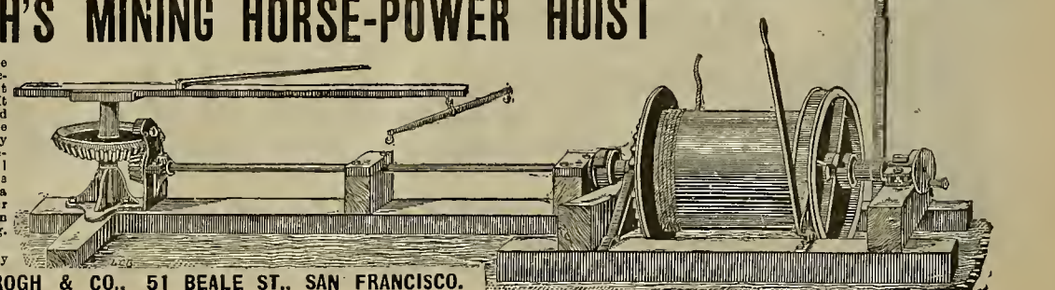

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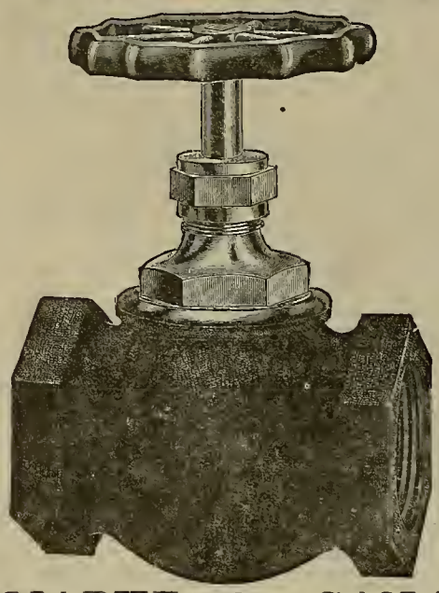

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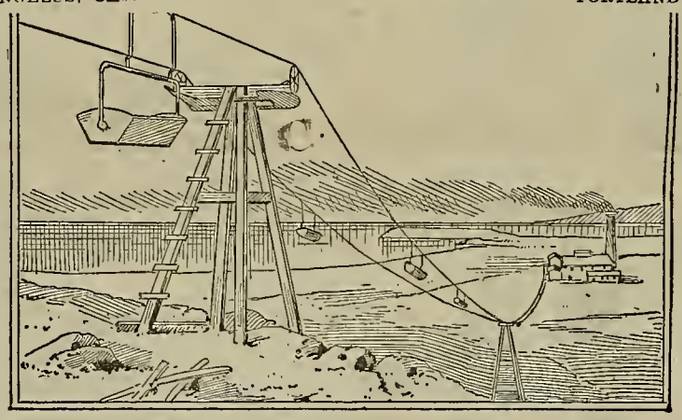

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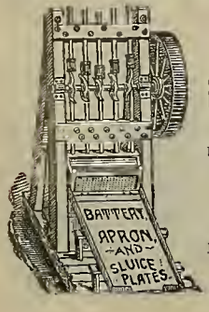

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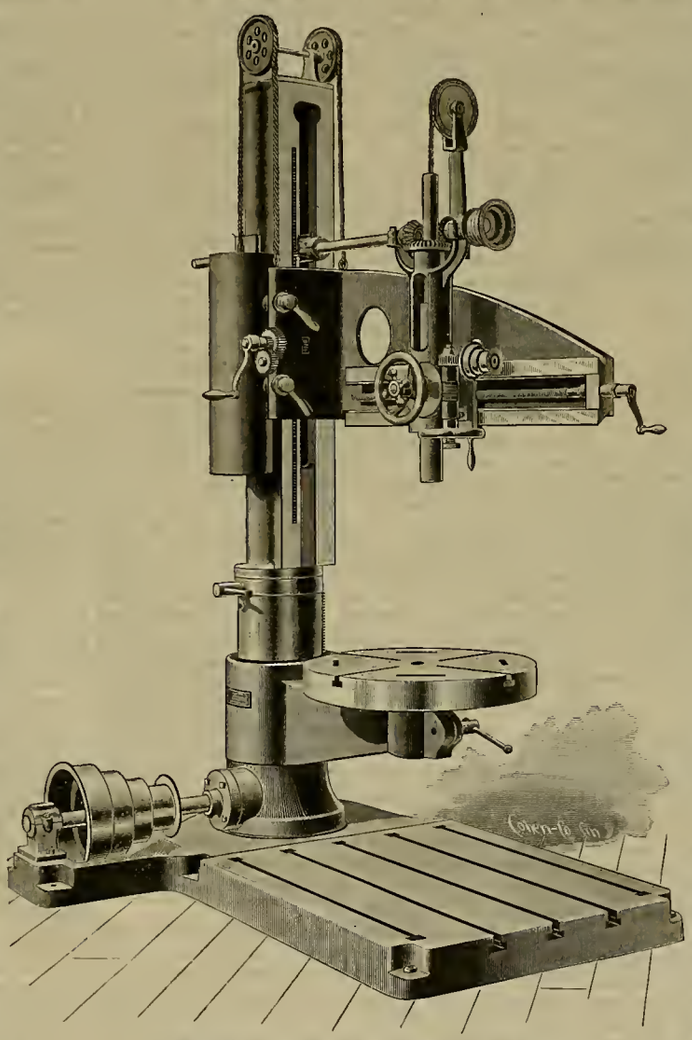
VOL. LXV.—Number 18.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, OCTOBER 29, 1892.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

Combined Upright and Radial Drill.

These drills are built by Messrs. Dietz, Gang & Co. of Cincinnati, Ohio, and are represented in this city by the Joshua Hendy Machine Works of No. 51 Fremont street. The accompanying cut represents the combined upright and power feed radial drill provided with the latest improvements, as well as containing all of the commendable features that should be embodied in every first-class tool of this character. The machine is driven from cone pulleys, as shown in the cut, by means of bevel gears running one to three, the larger of which driving the vertical shaft through inside of column, connecting with the horizontal shaft by means of mitre gears cut from solid steel. The horizontal shaft is connected by means of bevel gears, running one to two for driving the spindle. By this gearing the spindle is extremely powerful, the cone running five revolutions to one of the spindle; for this reason the machine does not require back gear, but must have two driving pulleys on countershaft, one running 400 revolutions and the other 200 revolutions. All holes up to 1¼ inches can be bored with the 400 speed and all holes above or counterboring will require 200 revolutions. This machine is furnished complete with countershaft containing two of the best friction pulleys made, thus enahling the operator to change the speed immediately. The feed is simple and powerful with quick return attachment. The column is made in two parts, the upper one being fitted in a stationary stump which supports the table arms and table. The table revolves all around the column, and thus can be used in any position. The upper column snpporting the gibbed arm with spindle head, has full circular movement depending, however, upon the position of the driving belt. The cone pulley has four speeds, the largest being 12 inches, the smallest six inches all for 3-inch belt. The machine is thoroughly balanced by weights on side of column, thus enabling the operator to change the position instantly. All lug bolts have lever attached, doing away with wrenches. Square tables with T slots furnished instead of round table, if desired. Diameter of column, 10 in.; height of column, six feet, six in.; drills to center of 52 in.; vertical adjustments of arm on column, 28 in.; receives under spindle over base four ft., four in.; receives under spindle, over floor, four ft., nine in.; height of table from base, 20 in.; size of table, 30 in.; adjustment of table arm on lower column, eight in.; diameter of spindle, one and eleven-sixteenths in.; spindle hored to fit Morse Taper, No. four; traverse of spindle, 11 in.; size of two friction pulleys, 12 in.; speed of countershaft for holes below 1¼ in., 400 revolutions; speed of countershaft for holes above 1¼ in., 200 revolutions; width of belt for cone pulley, three in.; floor space for base, three ft. x six ft.; weight of machine, about 3,200 pounds.



COMBINED UPRIGHT AND RADIAL DRILL.

THE famous Delamar Mining Co., of Idaho, is threatened with an apex suit that may become famons in the history of mining litigation. Tim Regan, owner of two-fifths of the Stoddard property, claims that it holds the apex of the Delamar Company's ore hodies. He has recently been doing some work to prove his theory, and expects soon to commence a suit for an accounting. A very large amount of money will be involved.

THE Medford River Mining Co., working a rich claim in Klamath river, between Shasta river and Humbug, has sold out to a Portland company of capitalists. The new mansgers are now operating it on an extensive scale, with Wm. R. Price, of Yreka, as business manager. The claim is now known as the Americau Bar claim, and it is expected considerable gold-dust will be taken out before the winter storms, with a likelihood of continuing operations all winter, unless extraordinarily heavy storms occur. The river does not interfere with claims above Humbug, in winter, as helow that point, on account of swiftness to prevent its overflow during ordinary storms.

CAPTAIN HACKETT, who was recently awarded the large Government contract for dredging the Oakland harbor, says that he will not get to work before the first of February. He will dredge a 300-foot channel, with 20 feet of water at low tide, from the old narrow-gauge slip to Webster street, and then from the foot of Sixth avenue to the cotton-mills, at a depth of 10 feet. The material dredged will be deposited on the marsh. They are now huilding the supports for the pipe off the railroad tract down by the freight-landing.

Work on the Newly Projected Geological Map.

The trustees of the State Mining Bureau are just now debating the question whether or not it will be best to proceed with the work already begun on the geological map of California or delay the same for an indefinite period. The question to be considered is one of finance; the members of the board are desirous that the work should go on without interruption and will vote to that effect if satisfied that the funds can be had to defray the expense of its continuance. State Mineralogist Irelan is of the opinion that the necessary funds will be forthcoming and advises that the work be kept up without intermission, and that thisshould be done if possible admits of no doubt.

Nearly two years ago the State Mining Bureau, having the preceding year collected the requisite data, published a geological map of this State, the same having been projected on a scale of 12 miles to the inch. This was termed a *preliminary* map for the reason that it was regarded as merely the initiative of more extended and perfect work afterward to be done. The fragmentary work done byProf. Whitney was adopted as the basis of the new map, that is, so far as it would go. To this was added a large amount of original matter collected by geologists sent into the field for that purpose, a very complete and accurate description of the mother lode forming a portion of the material so collected. This entire data having been incorporated into the new map the latter constitutes a valuabe addition to our geological knowledge of California.

To this map during the past yesr further additions have been made; the geology of more than two-thirds of the State having undergone revision and enlargement, producing what has been aptly termed the *progressive* geological map of the State. On the first map, each of the several geological formations laid down are made to cover large areas, whereas, on this more recent work these formations have undergone much correction and subdivision, besides which a large extent of new territory has herebeen represented. This revisionary work extends over the entire coast tier of counties, the great interior valleys, the main gold belt and the group of counties occupyingthe extreme southerly end of the State. Not only is thegeology of this whole region laid down with considerable minuteness, but the localities of the more important metals and minerals occurring there are denoted.

As this new map promises to be of much interest to science as well as a great utility in an economic point of view, especially to the prospector and the practical miner, it is to be hoped that the trustees of the Mining Bureau will be able to see their way to a continuance of work upon it; the more so in that this work need not, as we are assured, be attended with any great expenditure.

SEVERAL teams are hauling freight from Oroville to the Shakespeare mine at Forhestown. The reduction works being put up there are the largest in northern California, and the amount of material that goes through Oroville for that point is enormous.

A SIXTEEN-OUNCE nugget was found in the South Fork mine at Forest City, Sierra Co., last week.

MINING AND SCIENTIFIC PRESS.

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W. B. EWER, CHAS. G. YALE, } ..... EDITORS
ALFRED HOLMAN ..... MANAGER

Entered at the S. F. Postoffice as Second-Class Mail Matter.

Our latest forms go to press on Thursday evening.

San Francisco, Saturday, October 29, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Mining Machinery—Union Iron Works.
The Correspondence School of Mechanics, Scranton, Pa.
Unitarian Literature—Miss S. A. Hobe.

See Advertising Columns.

Comment.

THE defendants in the case of M. W. Fox *vs.* the Hale & Norcross Silver-Mining Company have filed an appeal bond with the county clerk in the sum of $2,300,000. The bond is furnished by the Western Surety and Guarantee Company. The heavy amount of the judgment allowed Plaintiff Fox, by Judge Hebbard, over $2,000,000, made it necessary that a correspondingly heavy bond should be given. The plaintiffs now object to this bond on the ground that the Surety Company is only incorporated for $100,000. More time is to be given to file a new bond. The whole matter will, in the end, go before the Supreme Court.

The goldminers of California, who have contributed to the wealth of the nation upward of twelve hundred and sixty millions of dollars of that precious metal which is the basis of values all over the world, now, for the first time in history, ask the assistance of the Government to enable them to prosecute their business in such a manner as to avoid injury to the rivers or the valley of the State. The committee of engineers appointed specially by Congress, at the request of the Legislature of California, having reported feasible plans for restraining the mining debris, it remains but for Congress to see them carried out in order to harmonize the interests and set free the hidden millions in the hills. It is very certain that during the coming session of Congress definite action will be taken either on the Caminetti bill or some similar measure. The time has come when the necessary laws should pass which will permit the hydraulic-miners of this State to once more turn into the channels of trade the million dollars of new gold a month, rehabilitate the mining industry, repopulate the partially deserted mountain towns, and bring prosperity to those camps throughout the Sierra Nevada which have for years been in adversity through the enforced cessation of hydraulic-mining. The recent decision of U. S. Circuit Judge Gilbert in the North Bloomfield case, respecting muddy water passing over dams, removes the only objection the U. S. engineers could see to the remedial measures proposed.

The low price of silver has caused mining people on many sections of this coast to turn their attention to prospecting for and developing purely gold properties. This is a good thing for California, which is still the leading goldproducer of the United States. There are thousands of prospects all over the State which only need capital to be properly developed and tested. Well-outfitted producing mines are held for investment by their owners and few are for sale. It is generally the undeveloped claims which are for sale. If people want gold claims they can find plenty of them here, but they must put their money in and test them. They cannot get a rich and well-equipped gold mine without paying a good round price for it. Many of the counties of California which are away from the main lines of railroad travel offer good inducements for investments, if capitalists would send their agents out to hunt up claims. They need not be prospected for, since many have already been found. What is needed is men of means to take hold of the undeveloped claims now held by poor prospectors. There is always an unchanging market for gold, but the only way to get it from a mine is to dig for it. This costs money in the first place, and money is what few prospectors have. If the men with money will help the prospector, it will be a good thing for them both and for the State.

The Executive Committee of the new State Anti-Debris Association has been visiting some of the mines to see whether or not the miners are trying to care for their debris. The party consisted of A. H. Wilbur, the general manager of the Anti-Debris Association; Will S. Green, editor of the Colusa *Sun* and an active member of the association; Supervisors Andrew Black, E. Greer and Geo. O. Bates from Sacramento county; D. H. Arnold of Colusa; L. P. Farnum of Sutter; E. Fagan of Butte; W. Phipps of Marysville; N. B. Kirlley of Yuba City and D. P. Durst of Wheatland. C. W. Cross, attorney for the Bloomfield Mining Co. and G. H. Magruder, an agent of the Anti-Debris Association, accompanied the party. Mr. Bates, the Sacramento county supervisor, said that each trip that he made to the mountains convinced him more strongly of the necessity of friendly relations between the farmers and miners. If a freedom of conference and general confidence and good-feeling could be established between them, the debris question would be practically settled. He believed, under such circumstances, the miners would do almost anything to impound their debris. Supervisor E. Greer said: "The miners seem to appreciate the situation, and they are building dams to restrain their coarse debris and settling pools for the finer material. They appear to be in earnest in their professed desire not to pollute the streams to a dangerous extent, and so far as we could judge, are striving to that end. The committee was impressed with the idea that, by the methods which the miners are adopting, the mines—or some of them at least—can be operated without injury to the rivers or valley lands. The miners are evidently disposed to take care of the tailings from their mines, and will be given an opportunity to test their methods. The editor of the Sutter *Independent*, in giving his opinion, says: "As to the North Bloomfield, there is no doubt that a considerable portion of the debris from the mine can be restrained in the settling-pool for a limited time, provided the mine is operated in good faith. At the same time the facilities are at hand for the exercise of bad faith, in the shape of a bedrock tunnel which opens directly into the mine and discharges into a tributary of the Yuba river; all the tailings can be run through this tunnel much more cheaply than the material can be elevated and run into the settling-pool. Of course to do this would be bad faith, and would be in contempt of court, but the fact that it can be done is matter for the grave consideration of the people and the Anti-Debris Association. We do not say it will be done, but the temptation will be strong.

All of these gentlemen, being dissatisfied with Judge Gilbert's decision, were looking for themselves to find if the debris was really bsing impounded. They do not seem to have been able to find anything wrong, although they evidently looked for it. Few of them know anything about hydraulic mines, and are "posting" themselves. Messrs. Greer and Bates, of Sacramento, are well disposed toward the miners, but the others have strong anti-debris prejudices difficult to overcome. However, they were unable to find anything to show that the miners were not acting in good faith to obey the decrees of the courts. The bedrock tunnel of the North Bloomfield is not used, and is not likely to be. That company has had trouble enough in the past. Many other mines will impound their debris as soon as they can arrange for it, since they are all anxious to work again

The Shasta County Miners' Association are carrying out rather a good idea at their headquarters in Redding. Secretary Hodson is collecting specimens from all the mines in the county, arranging and classifying them on shelves, and keeping them in a condition for reference by any one desirous of information. He has gold ores, silver, coal, iron, chrome and everything else found in the county. There is also a colored geological map which he has prepared, and any one can see the formation in which the mineral is found. Those desirous of investing in mining property may see the character of all the ores and mines and be directed to the ground. The collection is only intended to represent Shasta county, and is already of great interest. Dr. Hodson, the secretary, is an earnest worker and is gradually making a very valuable collection. The example set by the Shasta County Association might well be followed by other miners' associations in the State.

The days of rich pockets and nuggets are by no means over in California. For instance, a few weeks ago they got $10,000 out of a pocket in the Stow mine, Forbestown, Butte county, and the mine since made a cleanup of $20,000. Henry Miller, of Magalia, in the same county, found a little pocket in his claim from which he took out in a few minutes $580. Ed. Gilbert found in his drift mine near Butcher ranch, Placer county, a nugget worth $2300. It was about ten inches the long way, from three to seven inches in width and from an inch to an inch and a half in thickness. The whole surface was very irregular. Its beauty consisted of having the formation of crystallized quartz, with clear-cut corners, the sides of whose cubes shone with dazzling brilliancy at any angle from which a person viewed it. The mine has been worked more or less since 1856. Louis Page and partners at Bald mountain, Tuolumne county, after working a tunnel for 19 months, have struck several very rich pockets where they have found nuggets worth $40, $80 and $140, and lots more in sight. These are only a few instances seen in our exchanges in the past week or so, and there are doubtless others not chronicled. There are thousands of Chinese working in the mines of the State, but no one ever knows what they get; and in the richer claims run by white men little is said of the product. The gold-mining interests of California are becoming better recognized than they have been of late years. The northern counties are only partly prospected, and even in the older mining regions there is room for discovery. There are many mines being worked steadily by private parties which are paying handsomely, but as no stock is for sale, very little is said of them in the public prints.

Cable Railroad Patents Upheld.

The United States Circuit Court of Appeals, for this circuit, on Monday last, affirmed the decisions of the Circuit Court in favor of the Pacific Cable Railway Co., in suits brought by it against the Consolidated Piedmont Cable Co., of Oakland, for infringement of patents. The patents sued on were for a grip and for a tension apparatus. The former device was patented by Wm. Eppelsheimer, No. 189,204, dated April 3, 1877, and the latter wss patented by Henry Root, No. 244,147, dated July 12, 1881.

The grip is of the type known as "bottom grips," which implies the seizing of the cable from directly above, instead of taking it from the side, as in the Market street grip. In the Eppelsheimer grip there are two jaws, hung from the same center. In the grip frame is a slide-bar, to the lower portion of which are secured bearing rollers, which act upon the outside of the jaws to force them together, as these rollers, bearing up under pins in the jaws, open the jaws again. This grip is a practical one, and has for many years been in use on the Geary street road in this city. The grip used by the Piedmont road is also a bottom grip. Its jaws, main and slide are substantially similar to the corresponding parts of the Eppelsheimer grip. Instead, however, of the bearing rollers, to transmit the power of the slide to the jaws, the Piedmont grip makes use of connecting pins in an arrangement which may be termed a bell crank. This arrangement was held, by both the lower and upper courts, to be an equivalent of that of the Eppelsheimer grip, and consequently an infringement.

The Root tension apparatus is in general and extensive use. It is familiar to all who have visited the Market Street Cable Railway powerhouse. Its purpose is to take up the slack of the constantly-lengthening cable, and to keep it taut at all times. The cable enters the powerhouse and passes around a large sheave, which is carried upon a car to which a chain is secured, which suspends a weight in a pit. The weight keeps the car continually pulled back, and thereby maintains tension on the cable. But as the depth of the pit is the limit of the descent of the weight, and consequently of the retrogression of the cable-pulley car, it is evident that some means must bs provided to raise the weight again to continue its effect. To accomplish this, there is a second car or frame, which carries a pulley over which the weight-suspending chain hangs. This second car or frame is, at times required, pulled back by power derived from the cable itself, so that its pulley, passing under the chain, raises the weight to the top of the pit again. Thus there is perpetual and auto-

matic compensation for the stretching of the cable, which is thereby kept under the required tension.

The device used by the Piedmont Co. the court holds escapes exact similitude by a few changes of form, which do not affect the principle or mode of operation or the relationship of the parts, and is consequently an infringement. The Court of Appeals also holds that the Root device was a patentable invention, thereby sustaining the validity of the patent.

The Pacific Cable Railway Co., which owns these patents, is also the owner of a large number of cable-railway patents, chiefly those of the early state of the art, and which have always been regarded as the controlling patents of cable-railway construction. The company is the outgrowth of the consolidated patent interests of the pioneer roads and inventors. Its list of patents includes the primary inventions of Hallidie, the pioneer of the cable-road, whose practical expressions are familiar to all in the old Clay Street road; the patents of Hovey and Casebolt introduced in the Sutter Street road; the inventions of Eppelsheimer in the Geary Street road, and those of Root in the California and Market Street roads, and many others of later date.

The Foundry Business in San Francisco.

According to the idea of Mr. Irving M. Scott, of the Union Iron Works, the iron-manufacturing business in this city is not suffering so much from a depression of trade as it is from the methods employed in supplying the wants of the purchaser. Twelve years ago a great many articles were manufactured that to-day are imported, and while the business of the small manufacturing establishments has fallen off very greatly, the business of the importer of iron goods, as evidenced by the number of establishments now in successful operation here, has increased, so that, instead of the trade being greatly reduced, it has simply been transferred from the original manufacturer to the importer. The remedy for this would be, Mr. Scott thinks, the manufacturing of goods on the most improved type in vogue elsewhere, which we have not as yet in our State, even in the slightest degree, and we are working at arms-length and by rule of thumb, as we did 20 years ago. Rapid and cheap transportation by water and distribution throughout the State, which will enable us to market the goods manufactured, and a competing line that will bring us skilled labor at low rates, will enable the manufacturers of this coast to hold their trade and successfully compete with any part of the United States, and will be of great advantage to the permanent and healthy growth of the community.

While the other foundrymen of the city will doubtless agree with Mr. Scott that cheaper labor and cheaper means of distribution of product will benefit them, they will hardly be willing to admit the working "by arm's length and rule of thumb" proposition. As to the "manufacture of the most improved types of machinery in vogue elsewhere, which we have not in this State," the eastern concerns have taken up specialties while the works here have, by force of circumstances, had to do any kind of work which came along. It is only of late years they have been taking up specialties. The Union Iron Works itself made a hit in the way of ship-building and repairing, and it is in this department only that the works are especially busy at this time They still do general work, of course, but the other departments are now of minor importance comparatively.

The specialty of most of the larger foundries of this city was for years mining and milling machinery, and they attained an enviable reputation in this line. But their special methods, designs and patterns, the result of experience, were in time appropriated by others. A complete set of drawings, for instance, taken without leave from the Union Iron Works, on one occasion, served to start a shop in New York. There were few patents to protect the originators, and most of what there were have run out.

Our market for this class of machinery was gradually narrowed by railroad rates. Transportation from eastern points was much cheaper than from this city, and is to-day. We formerly shipped to Utah, Montana, Idaho, Oregon, New Mexico, Arizona and Mexico. To some extent, we do still, but the Northwest is now mainly supplied from Chicago. Our foundrymen now have to drum up trade in Mexico, which formerly came to them unsought.

Certain types of engines, made in different eastern cities by concerns which make them a specialty, are sold here cheaper than we can make them, without counting freight. Of course, under such circumstances, our local foundries cannot sell a homemade engine if a man is looking for a cheap one. Of late, therefore, in order to compete with the machinery importers, some of the larger foundries—the Risdon, for instance—have commenced to keep these ready-made engines and some other machinery in stock. A purchaser may have an engine, pump, etc., made to suit his special requirements or take one ready made of eastern make.

The fact of the matter is, our local iron manufacturers are handicapped by four features, high labor, high-priced coal, expensive iron and exorbitant freight rates. Not very many months have passed since they had a long struggle with the labor problem. They came out victorious, but the effects are yet felt in loss of business.

Most of the coal we get comes from foreign points and pays a duty. We produce no iron to speak of on this coast, and this must all be brought here from the East or abroad. When we start to ship machinery to points in or out of the State, we find a forbidding freight schedule. With cheaper labor, coal, iron and freight rates, Chicago foundries have captured a great deal of trade formerly ours.

Now, while we may manufacture certain specialties successfully—as we do, and as "good as the most improved type in vogue elsewhere"—especially water-wheels, gas engines, roller-mills, concentrators, ore-feeders, wrought-iron pipe, hydraulic nozzles and elevators and a few other things, we cannot, under present railroad, coal, iron and labor conditions, take up the general classes made by eastern works. We could not compete with them in those lines now, nor can we until the difficulties spoken of are removed.

Coast Industrial Notes.

THE West Almaden Quicksilver Mining Company has been incorporated at San Jose, with a capital stock of $10,000,000.

PORTLAND city council is considering a proposition to collect a monthly tax for each horse, cable or motorcar in service on the streets of that city.

THE Reno Electric-Light and Power Company of Reno, Nevada, has levied an assessment of 50 cents per share, delinquent November 10th.

THE large furnace of the Bishee, A. T., Copper Mining Company, being under repairs, between fifty and seventy-five men have been laid off for a month.

THE San Antonio Electric Light and Power Company has completed its plant, and is now furnishing Pomona and San Bernardino with the neccessary illumination.

THE Pioche Record says the smelting works and mines have closed down and the citizens have taken to reading Goldsmith's "Deserted Village." There is only one man left in Jackrabbit district.

THE poultry and eggs shipped from Petaluma to San Francisco during 1891 amounted to $1,200,000, the dairy products to over $1,000,000 and the hay, vegetables fruit and livestock to even a greater sum.

ABOUT 2000 carloads per month of red cedar shingles are being shipped East from various Puget Sound points. The eastern market instead of being overstocked can hardly be supplied and the demand is increasing in every quarter. With the new rates to go into effect January 1st, an equally big demand will be created for sawed fir and cedar lumber

THE Oakland Consolidated Street Railway Company has started an innovation that will be welcomed by the people. The company has had air-brakes placed on its cars, which are easily worked by the motorman. A test was made and it was found that a car going at full speed can be stopped in about 20 feet. The brakes will be of great value in case of accident.

AT the Spenceville copper mine and works, Nevada county, now reorganized under the name of the Imperial Paint and Copper Co., they are getting new machinery and the work of enlarging the capacity has already been commenced, and, as soon as possible, they will be turning out mineral paint, pure copper and bluestone in larger quantities than heretofore.

THE Dayton *Times* states that Al Holman has made a discovery of an alum mine in the Como range of mountains near the old Whitman mine. From what work he has done on the ground he believes that there is a very large deposit of the material. He sent some of the croppings to the Experiment Station at Reno and finds that the test shows that the sample contained 35 per cent of pure alum.

THE San Joaquin Valley Railroad has been leased by the Southern Pacific Company and will hereafter be known as the Fresno and San Joaquin Branch of the San Joaquin Division. The stations on this branch are as follows: East Fresno, Barton's Spur, Las Palmas, Eggers Spur, Tarpey's Spur, Clovis, Gordon and Pollasky. An agent has been placed at Pollasky and freight to other stations must be prepaid.

DAVID DYSART, who has charge of the National Ice Company's works at Floriston, near Boca, and in Nevada county, is about to put in a new dam for his company and that will form an ice-pond of great capacity. Chas. E. Uren has just completed the surveying for the big new dam. If the weather is favorable there will be a tremendous ice-crop harvested during the coming winter—larger than has ever been the case in all the past.

THE big wharf of the Southern Pacific Company at Santa Monica is now 2000 feet long. The wharf has recently been inspected by representatives of marine insurance companies of the coast and of clipper lines operating between San Francisco and New York. It is expected that a large additional area of land between Los Angeles and the ocean will be planted with cereals this fall for direct shipment from the new wharf which it is understood will be completed by March next in time for the coming season's crops.

THE San Jose Mercury says that eastbound freight shipments continue to go forward in large quantities. The total shipments last week amounted to over 3,500,000 pounds. Dried prunes took the lead last week, 1,418,400 pounds being sent forward. The greater portion of the prune crop has been shipped, and hereafter smaller shipments will be the rule. The shipment of canned fruit will probably continue to be heavy until the middle of December, as the canneries are still busy packing grapes and other late fruits.

WORK at Stockton on R. R. Smith's new dredger, which will cost $15,000, will commence in a few days. W. D. Delaney will superintend its construction. Another dredger, to cost $25,000, will be built in Stockton to be used in leveeing on the Sargent tract. It will be constructed for the following named owners of land on the tract: Eugene Wilhoit, L. E. Cross, D. A. Guernsey, M. D. Eaton and Stewart, Williamson & Derrick, Samuel Miller, Nathan Greer, Dr. F. R. Clarke, H. E. Williamson and W. B. Matthews. All the levees around the land owned by these gentlemen are to be strengthened. E. F. Cadle & Co. have the contract for building this dredger.

IN view of the difficulty of classifying imported coal as either "bituminous," containing less than 90 per cent of carbon and dutiable at 75 cents per ton, and "anthracite," entered free of duty, such difficulty arising because of slight variations either in the percentage of the carbon actually contained in the different samples of coal taken from the same mine, the Treasury Department suggests to the San Francisco collector that coal mined in a region known to abound in anthracite coal and similar to that which has heretofore been admitted free of duty may in future be classified as "anthracite," if the quality of fixed carbon contained therein as shown by analysis shall not fall below 88 per cent.

THE largest wire-nail machine ever built in the United States was finished recently at the works of M. M. Smith, Greenpoint, N. Y. After thoroughly testing the machine it was shipped to the Puget Sound Wire-Nail & Steel Company of Everett, Wash. The machine weighs 12½ tons, and will make nails weighing exactly ½ pound each at the rate of one a second. These nails are 7 16 inch in diameter by 12 inches in length, this being the largest size turned out by this machine, which can be adjusted to any length less than this. Nails of any length desired can be made by simply adjusting the feed, no change whatever being necessary in either the headers or cutters. This will be understood when it is stated that the wire is fed to the machine from a coil, the operation being very similar to that followed in the machines making small wire-nails.

THE residents of San Diego are in favor of a road affording them a direct eastern outlet, and the project to run a line to Phœnix and Denver has been often broached. A late San Diegan, who has become a resident of Pœnix, Ariz., has again started the ball to rolling by inviting the owners and managers of the Cuyamaca road to visit Phœnix for the purpose of agitating the question. Two routes are spoken of—one straight down the Salt River valley to Yuma, requiring very little grading, and the other to go via Vulture and out through the Harqua Halas, opening up one of the richest mining regions of Arizona. The latter route would utilize the Santa Fe, Prescott & Phœnix road as far as the Vulture, a distance of about 40 miles. The former route would develop more the immense agricultural resources of Maricopa and Yuma counties. An engineer is now going over the proposed route through the Harqua Halas, and there is no difficulty in finding an easy grade.

THE new fire boat built by the Fulton Iron Works for the Harbor Commissioners was tested last Saturday, Both engines and pumps were tried and did their work splendidly. The boat left Clay street at ten minutes past ten and made the trip to Alcatraz, under ninety-five pounds of steam and the engines making eighty revolutions a minute, in nineteen minutes against the tide. After passing Alcatraz the steam was raised to 120 pounds and the engines made ninety-two revolutions. The engines ran smoothly and the boat was stiff and very steady in the water. She behaved admirably when the landing was made. The fire-boat made fast to the wharf of the Pacific Yacht Club and the pumps were tested by Captain Farley and the fire crew. One and a half and two inch streams were thrown to a distance of 100 feet easily. The connections were tried singly, in pairs and all eight at the same time. All tests were most satisfactory and show that the boat will be very valuable in case of a large conflagration on the water front.

ON Sunday morning the main west works of the Patent Brick Co., situated on the line of the San Francisco and North Pacific Railway, and about three miles from San Rafael, were discovered to be on fire, and in less than two hours, in spite of the prompt and efficient aid of about two hundred men—mostly employes—the whole west plant, covering about two acres, was totally destroyed. The company has just renovated the works at a cost of $7000, and the total loss is estimated at about $16,000. The plant is the largest of its kind in the State, as it employs on an average 150 men, with an output of 75,000 bricks daily. The brick is dried entirely by hot air, and the works, being entirely covered, are allowed to run the year round, unlike the other brick companies, they being compelled to close down during the winter season. The company is at present building a new plant in the eastern end of the yard, and as this is nearing completion, the works will be in running order in a very short time. The works burned down will undoubtedly be rebuilt.

Personal.

W. E. SHARON, the Comstock mine superintendent, is visiting the city.

ROGER PRENDERGAST, who has been at Bartlett Springs for some time, has gone back to Virginia city.

PROF. E. E. BARNARD of the Lick Observatory, lectured this week before the Geographical Society of the Pacific on "Recent Visual and Photographic Astronomy."

R. T. ROOT, C. W. Barry, Judge and John Blakely have gone from Kingman, A. T., to White Hills to examine the mines of that place and gather in specimens for the World's Fair exhibit.

DAVID MENZIES, who has been employed at the Union Iron Works in this city for many years, has gone to Chicago as assistant superintendent of the Chicago Shipbuilding Company.

GEORGE ATTWOOD and Mr. Reynolds, of London, have bought the Rattler mine and mill at Fairview, British Columbia, and also the Brown Bear, Ontario and Wynn, all gold properties. They have secured land on the Okanogan river for the mill-site, etc.

E. F. DICKINS of the U. S. Coast and Geodetic Survey, left for Coos Bay, Oregon, on Wednesday. He has been engaged in work on the upper coast all summer and only returned a few days ago. His present trip will be a short one, for he will be engaged in office work in the city this winter.

CHAS. R. WEBB, representing parties interested in furniture factories in Michigan and Chicago, has been visiting this city with a view of starting a large factory here, for both costly and cheaper grades of furniture. He seems to be favorably impressed with the situation and goes East this week to report to his principals.

Mines and Mining in Nevada County.

By Our Traveling Correspondent.

Part II.

GRASS VALLEY, Oct. 10, 1892.

TO THE EDITOR:—Some years ago, mining about Nevada City and Grass Valley was greatly relieved and stimulated by the building of the South Yuba canal, by which water was substituted for steam as a motive power. Many new enterprises sprang up that had been unable to meet the expense of a steam plant, and these districts entered on a new era of prosperity. But again a call is made for "cheap power," and within another year Grass Valley and Nevada City will have a system which for cheapness and efficiency will doubtless be unparalleled on the coast.

The projected introduction of electricity seems most timely. Rates have gradually risen till waterpower has assumed nearly the early prohibitive rate of steam. The company first furnished water for 15 cents an inch. Some of the miners have contracts now for 18 cents, but it is doubtful if the contracts will be renewed at this rate on their expiration, as one of the largest mines, its contract having expired, is paying 23 cents an inch, and unable to get a contract for any continued period even at that rate! The water company has evidently foreseen that electricity was destined eventually to succeed them, and they are making preparations accordingly. By a plan not yet given to the public, it is intended to convey 1200 inches of water to the irrigation districts of Placer and Sacramento counties, where, it is said, double the price now paid by the miners will be obtained. The plan is already being carried into execution. The great dam the company is constructing below its present Fordyce works will collect the water from an immense watershed and furnish the water contemplated for the new project. This also will necessitate, of course, the widening of the present canal, the building of additional ditch, etc. Owing to the absence of the manager from town, I was unable to secure full details of the project.

Even with waterpower at hand, the mines are dependent on steam for several months each winter, as the water, coming from above the snow belt, freezes; hence it is necessary that each mine have a steam plant anyhow, as the pumps must be kept going continually. The obvious advantages of electricity are universally recognized and its introduction gladly welcomed. Properties inaccessible to water and unable to afford steam can readily avail themselves of the new power; but there is no need of entering the field of prophesy or conjecture. Nearly every one, and that includes a great many present inoperatives, is preparing to utilize the force. Time will give the result.

TWO ELECTRIC-POWER COMPANIES AT WORK.—As may not be generally known, two companies are preparing to bring in electric-power. The only one so far to make known its intentions to the public—in fact the only one that as yet has assumed business proportions—is that of Alf Tregidgo, whose plans have already been described in the PRESS. Mr. Tregidgo intends taking water from the South Yuba below the "ice belt." Two miles above Pindoa bridge, where the river narrows, work has begun on the dam, which, resting on bedrock, will be 40 feet wide on bottom, 150 at the crest and 27½ feet high; thence a canal, four miles in length, will be constructed. A pressure of 380 feet will be thus obtained to run the dynamos on the bank of the river below, whence the power will be transmitted to the mines. The capital for the enterprise is secured and the projectors are sanguine of the completion of the work by next spring.

Mr. M. C. Taylor, the Grass Valley foundryman, has also been perfecting a scheme, and if its ultimate intentions are carried into successful operation, it will surpass anything yet conceived in this State for long-distance transmission of power.

By his plan, a dam will be built in the main Yuba, about 50 yards below the junction of the North and Middle Forks. All the preliminary rights of water, amounting to 10,000 miners' inches, and a dam-site, are secured. The dam will be a permanent structure of rock and cement, 220 feet long, 12 feet high, 12 feet at base and 6 feet at top. A canal, 10 feet wide and 4 feet deep, with a ½-per-cent grade, will carry the water about seven miles. At the end of this canal a perpendicular fall of over 500 feet will develop a power equivalent to one-horsepower for each miner's inch, or 10,000 horsepower. The preliminary survey for dam and canal has already been made. It will be necessary to construct 2½ miles of flume, owing to the precipitous route, and a roadway must be blasted along the mountain upon which the flume may rest, thus lessening the liability to accident. The water-flow will be unceasing and the power free from interruption on accouot of ice, as the works are all below the snow-belt. Steps toward the formation of a company are being taken, for the purpose of making available sufficient power for the immediate use of Grass Valley and Nevada City. The estimated cost of this is $60,000, and the time required to construct the work as planned is two years. These districts will certainly not want for cheap and abundant power.

Mr. Taylor, however, looks beyond the mere local supplying of power, and anticipates that by the time the work thus first contemplated is done, science will have so eliminated distance as a militating factor in electrical transmission, that the full power at hand may be conveyed to San Francisco and furnish the major portion of the power necessary for the present electric and cable systems, foundries, mills, etc., at far less cost than this power can now be generated at home. There is certainly nothing visionary in the scheme, as far as concerns its practicability. At Frankfort-on-the-Main, Germany, electricity has been transmitted a distance of 110 miles, securing an actual efficiency of 75 3 per cent, and that with a small and defective plant.

Mr. Taylor's scheme is a comprehensive one and calls for more capital than may immediately be forthcoming. But surely no better investment is open to capital on the coast, and the immense value, both to the commercial and manufacturing interests of the State and to those who may make the undertaking, cannot be overestimated.

THE GRAVEL MINES.—Aside from the introduction of electric power, the latest feature in mining about Nevada City is the more general adoption of milling methods by the gravel mines. Drift gravel mining in this section has only within a very recent period attracted any considerable attention. Just north and east of town is a rich channel, running east and west, that yielded well in the hydraulic days of the past. The gravel differs from the cement character of the material of other localities where crushing is in vogue, as on the Forest Hill divide or at Bangor, and has heretofore been considered free-washing. The first mine here to make the innovation was the Harmony. Gravel that averaged at most $1.50 a car when washed, was found to yield $6 to $13 when milled. The obvious advantages of crushing have led to the erection of a ten-stamp mill, which has been completed within the past two months. The present company, a Nevada City corporation, Geo. Hothersole, superintendent, has been developing for the past two years. The mine is opened by a 30° incline, 320 feet deep, and thence by a tunnel 740 feet to the channel. Breasting at present is in the west drift. The channel is here from one to five feet in thickness and widens to 240 feet.

THE WEST HARMONY adjoins the above mentioned mine on the west and is owned principally by W. W. Stow. Here a ten-stamp mill has just been completed also. The channel is reached through an incline 565 feet deep and a north tunnel of 700 feet.

Both mills are said to be giving excellent satisfaction, and will douhtless lead the other mines to adopt the same methods. Mr. W. W. Stowe also owns the adjoining Tip Top mine, as yet a prospect.

THE MANZANITA mine is on the same channel as the foregoing. Mr. Robert Simmons is superintendent. This is also a new enterprise but has not yet erected a mill. There is a 12° incline of 225 feet, and, from the bottom, a tunnel 650 feet into Washington hill. The channel is expected within a few more feet. This is a very large property and possesses valuable water rights. New waterpower hoisting works will soon succeed the present crude plant.

THE ODEN is another mining company lately started on the channel and in what is believed will eventually prove a good mine. It is a San Francisco corporation. The Centennial is another promising mine with a 2500-foot tunnel. So much for gravel mines.

For quartz the outlook is quite as favorahle. The principal mines lie to the west of town on Deer creek, on parallel north and south ledges and on the line of contact of slate and granite.

THE MOUNTAINEER mine, W. A. Dennis, superintendent, is reserved in its statements to the public. It is a steady dividend-payer and has run for the past dozen years. It has a 20-stamp mill and six Frue concentrators. The sulphurets vary from $80 to $170 and are sold to the highest bidder. During the past year the 850-foot level has been opened.

THE CHAMPION lying west of the mountains is the best-paying mine in the Nevada City district and one of the best in the county. Mr. F. Zeitler is superintendent. Fifteen stamps are now adding, which will make the mill one of 30-stamps. New and concrete foundation has lately been put under the mill; four frues will be added to the seven already in use and a 5-foot Dodd-water-wheel will take the place of the present 6-foot Pelton in running the stamps. This company has introduced with the new batteries the patent stem–guides of the Union Iron Works by which in case of accident one stamp can be removed quickly without dismantling the other four or stopping the whole mill. The large reverberatory furnace 70x13 feet has been rebuilt. The mill will be as modern and complete as any in this section of the State.

The shaft is down 1000 feet and stoping is going on in all levels, north and south a distance of 400 to 900 feet. The rock is 6 per cent of sulphurets, carrying both gold and silver in the ratio of 15 oz. of silver to $100-of-gold. The silver is obtained by the "hypo" or "Kiss" process; i. e., after chlorinating, and the gold extracted, the tailings are further treated to a leaching process of hyposulphate of soda. This is the only mine in the county where the silver is saved; in fact it is the only one that carries any considerable quantity of silver. Further, it is the only mill that has its own chlorination works. Mr. A. Maltman an experienced assayer, is in charge. Mr. Maltman is also agent for the Portland, Or., Smelting Works, and has made several large shipments of concentrates from mills in the district with better returns than these mills have heretofore obtained.

THE PROVIDENCE.—Previous to a year ago the mine had been idle for three years, during which time it had fallen into a dangerous condition. The present company, Col. Carl Davis, superintendent, took charge 11 months ago and has spent nearly $50,000 in improvements and developments. The old shaft of 1150 feet has been retimbered and sunk further about 200 feet and the old works cleared out. They are now opening up the 1400-foot level, running south 350 feet with 300 feet more to go to strike the chute previously worked from the surface to the 1200-level. New pumps complete and a 12x20 Burleigh compressor have been put in. From the 1200-level a crosscut to the back ledge, or Ural ledge, was run 600 feet west. On the Ural it is further intended to drift south, securing 600 feet of backs.

On this property there are two ledges; the first, in which are the old works, is entirely in granite; the second, or as mentioned above the Ural, is on the contact of granite and slate, respectively. The hanging and foot walls of the ledge dip east at an angle of about 50°. This is also the Champion ledge.

The company has a fine 40-stamp mill, at present idle. A Dodd-wheel has been put in here, too, with marked success over the old Collins-wheel, making necessary only 25 inches of water instead of 60. In the mine the new fumeless powder has been successfully introduced and the miners refuse to work with any other kind, as there is a complete absence of the injurious effects of blast fumes and they find it possible to resume work almost immediately after the firing of a shot.

THE WYOMING.—This lies north and on the same vein, though at present there is a misunderstanding between the owners of the mine and other parties as to just which vein the rock now being extracted belongs and so no very reliable facts regarding developments could be obtained. The company has no mill and is storing the ore on the dump. Mr. John Buffington is superintendent.

THE NEVADA CITY.—This continues on the Ural lead to the north. The hoisting works have lately been rebuilt and the mill repaired. The mine is opened to the 1000-level.

THE SPANISH.—This is a splendid little mine persistently worked by men of limited means. It lies to the north of the foregoing mines and on a lead to the west. It has a 5-stamp mill and is developed by an incline 250 feet deep. It is owned and worked by the Lord Bros. The mine is more than paying its way and is improving with depth.

THE YELLOW DIAMOND.—This is one of the latest and most promising quartz enterprises in this section. It is 3½ miles west of Nevada City and evidences seem to show it a continuation of the Ural ledge. The present company has title to 4200 feet on the vein. Work has not yet progressed far enough to show its full capabilities. The shaft is down but 85 feet, whence a crosscut has been run on the ledge showing already a good body of fair grade ore. The plant consists of hoisting-works adapted to a depth o 500 feet. Waterpower is readily available; securing 125 feet of pressure with 250 feet of pipe. Mr. A. F. Dunnington, late of the U. S. Geological Survey is superintendent. It was while engaged in geological work that Mr. Dunnington stumbled upon this property and immediately set about forming a company for its development.

FEDERAL LOAN.—Lies on the east boundary of the Nevada City belt and four miles east of town. It also has been opened through the persistent efforts of a local corporation of limited means. It has a 5-stamp mill completed about a year ago. They are now opening up the 500-level and stoping in the others. The ore like all the rest in the district, is heavily sulphuretted. It carries besides a considerable quantity of galena and zinc blende. John Vincent is superintendent. Adjoining is the Le Compton of J. J. Ott, now flooded, but will be opened in the spring.

Consumption of Cyanide.

SAN FRANCISCO, Oct. 22, 1892.

TO THE EDITOR:—The consumption of potassium cyanide is vastly in excess of that necessitated by the dissolving of the gold and its precipitation by zinc; this discrepancy is due to several causes, thus:

1st. The decomposition of the potassium cyanide by atmospheric carbondioxide, in the absence of caustic alkali which would prevent it.

2d. The decomposition of the same by atmospheric oxygen, not entirely avoidable.

3d. The double decomposition between the potassium cyanide and base metal compounds, such as copper sulphide, iron and copper sulphates, lead sulphate, etc., preventible, except the first, by means of an alkali.

4th. The electrochemical action produced by the contact of zinc with gold, silver or iron. Zinc precipitates precious metal from the solution because it is positive to precious metal in that solution. But the solution is a solvent of precious metal, and the latter can only be prevented from redissolving by constant contact with zinc which dissolves in its place, so that it is as though the precious metal should be dissolved and precipitated many times over. Every atom of zinc which dissolves withdraws from service two molecules of potassium cyanide. The objection applies to electrolytic precipitation in so far that a continuous expenditure of energy is necessary to prevent resolution of the precious metal, whether that energy be obtained by dissolving zinc, or by other means. The difficulty may, I believe, be obviated by so arranging that the precious metal shall be absorbed by quicksilver which will, I think, protect it from further action tending to its resolution. Sodium amalgam not only meets this requirement, but also regenerates the solvent in so far as the latter is engaged in holding precious metal in solution, but sodium amalgam has the disadvantage of wasting itself in the decomposition of water.

The ideal precipitant is a salt of potassium, sodium, or calcium, which will precipitate the precious metal as an insoluble compound, regenerating the solvent solution to an equivalent extent, though the latter point is not important when gold only is in question, because the proportion of cyanogen engaged is then small. C. H. AARON.

Patent Law Amendments.

NORTHAMPTON, MASS.

TO THE EDITOR:—The postponement to the next congressional session of Senate bill No. 3246 affords opportunity for American inventors everywhere to examinine its provisions, and, if dissatisfied with any of its 11 sections, to interrogate their respective senators and representatives and endeavor to secure such modifications as they may think desirable. Section 1, especially, seems worthy of their attention. It ostensibly aims to amend clause 2 of section 4887 R. S., by which, as well known, the duration of an American patent is made dependent on that of the earliest-expiring previously granted foreign patent for the same invention; but the amendment would seem to leave the most obnoxious feature of the clause substantially unchanged. Especially vexatious is the clause to the creators of those more notable devices which, to some minds,

constitute the chief justification of the patent system. If, as commonly supposed, legislators aimed by it to give their constituents an advantage, it has signally failed nf its purpose; the recnil of the weapon has proved wnrse than the discharge. Of patent-granting countrles, our nwn is now admittedly foremost, alike in the liberality of its patent law and in the number and character nf its useful inventinns. The numher of "aliens" excluded from drawing royalties from this side is a mere bagatelle to the hnst of American inventors deprived, hy this ill-advised clause, of a revenue of many millions, which would have been drawn frnm the foreign user and circulated here; it heing notorious that a large majority of them elect to forego the dangernus foreign privilege, with the result that American inventinns have generally heen as free as air everywhere save in the country of their birth. *Wipe the clause out!*

GEO. HENRY KNIGHT.

Tuolumne and Calaveras Counties.

TO THE EDITOR:—During the past two weeks I have revisited the mines of Tuolumne and Calaveras counties. Owing to a scarcity of water there is a general dullness all along the line, but the time is being utilized in dead work and preparation for the winter.

TUOLUMNE COUNTY.

The Buchanan is quiet for the time being but will soon start up. At Sumnierville the old Eureka runs her 20 stamps right along and is now down 1100 feet. The Porto Fino is looking well, with its ores going from $35 to $45 a ton. The Carlotta is closed since Mr. Symond's acciden ial death. Oliver & Kelly have taken hold of some of the mines in this section and will soon get tu work. At Sonora the Golden Gate was hung up temporarily by an injunction but expects soon to resume business. The San Guiseppa is still in litigation. The Bonanza boys are working away but have expended about $50,000 since their last pocket. They will soon need a good ore to get even, but that is the style of the Bonanza. At Soulsbyville, the Black Oak is sinking while the Platt & Gilson is hung up seemingly for good At Quartz Mountain the App mill is running on quartz from the Dutch mine. The Dutch has been giving the owners lots of the "stuff," and a fine residence now being erected is an evidence of it. At Jim town and Tuttle town there is very little doing. Capt. Neville is crowding the Dead Horse in a way that promises to make it a very lively dead horse ere long. In a month from now the mines all along the line will be again moving.

CALAVERAS.

At Murphys, O. B. Hardy is shoving the Beatrice right along, and has his mill and tramway about completed. On Indian Creek, Cunliffe & Driver are opening up a shoot of very good rock. Just above them Geo. Hingen is driving a tunnel on his Dora mine and has a good prospect. The Washington, Calaveras and Right Bower are idle. At Sheep Ranch the Sheep Ranch mine is running steadily with the shoot lengthening out at each level, and it is now 1200 feet long, of high grade quartz. Mr. Rodaseni of El Dorado has "gone over the divide" and his mines will soon be appraised. He is supposed to have buried about $150,000, the location of which his heirs would like exceedingly well to strike. Over at the Shenandoah the mine is looking very well and will soon be given five more stamps. There is some good ground east and west of the Shenandoah that should be operated, At R. R. Flat the Keystone and French mines are working. Mr. Eoright has pulled out his mill. At West Point Mr. Rhule has got the Lone Star to shining in a way that is very satisfactory to its owners. The Riverside is soon to be started up. The Blazing Star has bought and honded all contending mines and will soon change hands and be operated largely. At Glencoe the Banner is being pumped out for inspection.

Near Mokelumne Hill the Harrold mine is putting up a Huntington mill. The old Ilex mill has been moved away to the Stickel mine at Angels. The Quaker City is in good ore and will soon he reequipped in a modern manner. The Ellencino Gravel Co. is sinking on Chili Gulch. Just ahove it a gang of Chinamen is piping in good gravel. Beyond it Messrs. Cameron and White are getting ready to work the gravel of Sprig Gulch. The old Union mine is closed as is the Shorpe. At Angels the Utica is running right along but the other mills are waiting for water. The Stickle has her 60 stamps all in place and with the Utica's 60 will soon have 120 going on Hayward & Lane's mine. As soon as water comes in the other mines will all start up. The Blair is putting up a mill and Mr. McKenzie has 16 feet of good ore on the Cherokee near Altaville. Demarest and Fullen are rapidly increasing their iron works to accomodate their fast-growing trade. The Union Ditch has had its reservoirs rehuilt and everything looks favorable for an abundance of water in the future.

E. H. SCHAEFFLE.

Is the Cyanide Process an Economical One?

REDDING, CAL., Oct. 15, 1892.

TO THE EDITOR:—In the last two numbers of the MINING AND SCIENTIFIC PRESS are two articles referring to and in part replying to some criticisms made of the MacArthur-Forrest process in a paper read before the Shasta County Miners' Association, which I may say here is an association of owners and superintendents of mines in Shasta county, at whose meetings subjects of interest to the welfare and advancement of the mining profession are freely discussed. The paper of Mr. Aaron, published in your issue of Oct. 8th, assumes that I implied that the MacArthur-Forrest patents were anticipated by the electro-gilders. I showed, as clearly as necessary, the growth of the use of cyanogen as a solvent for gold, and gave an instance where 40 years ago a solution of cyanide of potassium was used to dissolve metallic gold, not a compound of gold, as stated by Mr. Aaron to he the form of gold employed by the electro-gilders, hut a plate of metallic gold was to be suspended in the solution of cyanide of potassium and dissnlved for the purpose of plating the article to be gilded. That ought to have been plain ennugh to even a less acute critic than Mr. Aaron. The question nf interest to us as mining men is not who anticipated Simpson, Janin or MacArthur, hut has the process been demonstrated to be a really practicable method nf extracting gold from its ores. That a snlution nf cyanide of potassium will dissnlve the gold from ores, I gave instances to prnve. But will it dn sn at an expense that will leave a profit tn the mine-nwner is, it seems tn me, a question nnt so readily answered. Will Mr. Aaron kindly answer that question?

Mr. Scannell, in the issue of the MINING AND SCIENTIFIC PRESS of Oct. 15th, has given us a mnst interesting statement of the working of the prncess at the Mercur mill, for which he deserves the thanks nf every one seeking information upon the subject. Here we have, for the first time in America at least, something definite and bearing the stamp of entire candor. In making my estimate of the workings of the Mercur Co., I was guided by reports of those who had been upon the ground, as well as the report of the Denver Co. and the reports of the Salt Lake papers, which as long ago as last January stated that mill would shortly commence putting through 50 tons per day. The cost of $5.60 under the circumstances is not excessive, considering the location of the property. J. H. MORTON.

The Platinum Mines in Russia.

The platinum beds of the Ural mountains, according to the *Journal de la Chambre de Commerce de Constantinople*, are the only ones in the world where this metal is found in grains. Platinum is found in Brazil and in the Cordilleras in the hard serpentine rocks, but never in the form of grains. The platinum beds of the Ural mountains are found in various districts; in the north, at Besserski, in the Government of Perm, in the district of Khotourski, and in the State properties of Goroblagodatski, where 66 mining concessions have been granted. All the beds of the northern region are situated in the basin of the River Touri, in that of the tributary stream of Taghil, and in other tributaries higher up.

On the western declivity of the Ural mountains there is another platinum bed near the River Outka, a tributary of the Tchoussova, and the basins of the higher tributaries of the Outka, near the Ural river. The platinum found in these places is in the form of grains, in sand frequently containing gold. The weight of these grains is from 17 to 21 grammes to every 1640 kilogrammes of sand. The richness of the platinum heds varies in the same proportions. In some the thickness of the turf covering the sand does not exceed from 2.16 metres to 2.88 metres, while in others it varies from 10.80 metres to 14 metres, so that it becomes necessary to work underground. The thickness of the platinum sands does not vary much. A noticeable characteristic is that they are found in the form of friable grit, and easily washahle. The clayey sand is rarely met with.

The beds in the northern districts of the Ural mountains are most frequently of little depth, thus allowing the turf to be easily removed and the platinum is quickly reached. The platinum found in this district contains a considerable proportion of gold, whereas that found in the Taghil district contains hardly any. Moreover, the northern platinum and that of the Taghil district are very different in appearance. The former appears clear and very brilliant, while the latter is of a dull color and is frequently found mixed with rare metals, such as iridium and osmium. The size of the grains is about the same in the two beds. The demand for platinum for industrial purposes is relatively restricted, as it only dates from the last 12 or 15 years. It is largely used for electric lighting and dynamo conductors, and considerable quantities of platinum are now employed in chemical and other factories.

During the last 12 years, the annual production of platinum has averaged about 3194 kilogrammes, of which half has been derived from the beds in the north of the Ural mountains belonging either to the State or to private persons. Throughout the whole world only about 3270 kilogrammes of platinum are annually used, but it is anticipated that this amount will soon be considerably increased, and it is stated that the platinum heds of Bisserski can alone supply the total quantity required for the consumption of the world. When the demand for platinum was insignificant and the price very low, the goldminers who found platinum while seeking for gold frequently, it is stated, used the former instead of lead as shot for firing at wild birds. It is only since the demand has increased that greater attention has been paid to this metal. All the platinum extracted from the Ural mountains, after having paid a tax of three per cent in kind, is sent as raw ore to St. Petersburg for treatment and shipment to foreign markets.

IN reply to an inquiry from Santa Barbara, Mr. C. P. Huntiogton, in speaking of the railroad work between Santa Margarita and Elwood says: "Work will go on from this time forward until completion of the heavy work between San Luis Obispo and Santa Margarita, or, in other words, the work will be confined to that section for some considerahle time before any work is done elsewhere, but work will he commenced on the other portions, so that it can be finished hy the time of the completion of the heavy work." This is the first authentic assurance the people have had that work in tunneling would be entered upon this fall, or, in fact, very soon; but now there is no longer any doubt but that this branch of the work will immediately be entered upon and he prosecuted vigorously until spring, when a force, adequate to complete the balance of the road hetween the tunnels and Elwood by the time the tunnels are completed, will be set at work.

GOOD CLEANUP.—A correspondent writes us from Auburn, Placer Co., Oct. 8th, that Superintendent McCullough of the Mina Rica Gold-Mining Co. crushed, for Holcomb & Miller, 30 tons of ore from Eclipse Wedge mine. The yield was 333½ ounces, or $177 per ton. The ledge is 18 inches, heavily sulphureted and cheaply worked.

Extracting Magnetic Particles from Auriferous Ores.

Mr. Walter B. Bassett, in a paper read before the Federated Institution of Mining Engineers (Great Britain), says:

The demagnetizing of ores containing magnetite or magnetic pyrites has received considerably more attention in America than it has in England, and at the present moment there exist several methods of magnetic extraction in the former country which have attained more or less success in the treatment of granular magnetic ores. The great difficulty which lies in the way of devising a satisfactory process for treating these ores is the fact that, unless the particles are thoroughly disseminated, the magnetic grains, while attaching themselves to the magnets, are apt to inclose certain of the nonmagnetic granules with them, and to carry them into the portion of the apparatus destined fnr the magnetic grains alone. This difficulty is more acutely felt when treating magnetic pyrites or other ores possessed with only a feeble magnetic force, as the stream of magnetic particles must then be directed so close to the magnets that, unless the opposing forces are nicely balanced, there is great probability of error occurring. When the grains vary largely in size, it is preferable to screen the ores before subjecting them to a magnetizing process, as it is obvious that extremely fine grains of matter are far less susceptible to the action of any force when acting through a medium, such as air or water, than are grains of a larger size. It therefore follows that an apparatus that is perfectly capable of refining an ore, the grains of which are of fairly unform size, will fail to do so at one operation when there is a large discrepancy in the size of the articles to be treated.

Experiments have been made on zinc slimes from a mine in the Pyrenees, where some difficulty was experienced owing to the quantity of magnetite present. In this case, a successful treatment was effected by a dry process, but inasmuch as this involved drying the ores before demagnetizing them, an extra expense had hitherto been incurred. But the results of experiments have led the writer to helieve that a slightly modified machine, constructed on this principle, will be ahle to cope with the slimes as they come from the grinding-mills, without having to previously dry them. In the case of a sample of magnetic pyrites containing nickeliferous ores, the magnetic power possessed by the pyrites was so feeble that a stream of particles descending through water within one-half inch of a powerful magnet was not deflected appreciably, and in order to effect a magnetic separation the particles had to pass within one-eighth inch of the poles of the magnets. For ores of this class it is doubtful whether an economical magnetic separation can he effected, as with such limited area open to the passage of the grains, as would necessarily be the case, the plant would have to be of very large size to treat ores in quantity. The simplest problem by far is the treatment of the so-called ironsands, found in many countries extending for miles along the seashore. These sands, with the exception of portions where gravel is interspersed, have the grains of fairly uniform size, and, for the most part, with the rough edges rounded off by the action of the water. The grains of these sands, possessing a specific gravity of 5, will readily sink through water, and the separation of the magnetic from the nonmagnetic grains can he easily effected through this medium.

A great deal of dfficulty has been felt in many auriferous districts in dealing with the ores for gold extraction by processes dependent on the action of specific gravity, owing to the fact that the specific gravity of the magnetite is so high as to cause it to remain with the gold after the washing process has been performed. Many sea-beaches in New Zealand and California are composed of alternate layers of magnetite and quartz sand, and after a period of heavy gales, when the surf has subjected the sand to a continual washing, the layers of magnetite and gold are found to be almost free from quartz sand, and the line of demarcation between the light-colored sand deposited in fine weather and the black sand before mentioned is very plainly seen. It is at this time that the "beach-comber," as the alluvial goldminer of the sea-beaches is called, reaps his richest harvests. With his beach-box, which is a combination of amalgamated copper plates and riffles worked with a stream of water, he washes the sands of his claim over and over again, and rarely finds that gold is absent from them.

It is from these sands, when properly treated by a demagnetizing process, that the largest amount of gold may be obtained. Working on this principle, the magnetite once and for all will be properly separated from the gold, and unless further deposits of gold are washed up from beyond low water, as some miners believe, the whole of the sands may have all the gold contained therein extracted at a low cost and without the possibility of error. In many cases chemical processes can be substituted for the amalgamation and washing processes, but the problem as regards these may he summed up in a very few words, as follows: Will the amount of gold ohtained be from one-fourth ounce to one ounce per ton? If not, these processes may be dismissed without further thought, as the writer believes that the cost of the most modern of the cyanide or chlorination systems, with the most favorahle adjuncts, cannot he brought below £1 per ton of ore treated, while many others cost a good deal more.

With electromagnets, the cost of treatment when water-power is procurable is estimated at 1s. 6d. per ton, made up as follows: Attendant at turbines and dynamo, 1s. per hour, or 3d. per ton; attendant to feed sand to machinery hy means of a centrifugal pump, 1s. per hour, or 3d. per ton; attendant to remove the refined products, 1s per hour, or 3d. per ton; depreciation of plant, repairs, renewals, balance of trade, charges and expenses taken at 9d. per ton, making a total of 1s. 6d. per ton, a very small item when compared with the 20s per ton. of a direct chemical process, while the fact that pure magnetite is ohtained as a hye-product should not be overlooked, when it is remembered that no better ore for the manufacture of steels exists than magnetite.

Mechanical Progress.

Brushes.

When a painter buys a poor brush, he is very much like the man who takes in counterfeit money for the genuine article, either a poor judge or too careless of his own interest or too confiding in his fellow-man to look at it closely. Now, my boy, here are two propositions which I wish to impress upon your mind: First, that it is of the utmost importance to you that you buy and use the best brushes in the market; second, that nine-tenths of the brushes kept in the retail stores are not worth taking as a free gift, because, no matter how well skilled you may be, a poor, ill-shaped brush will retard your progress and in a measure spoil your work. I have no doubt but brushes are often ruined by careless and improper usage, but judging from long experience and observation, I am led to believe that more of them are spoiled in the making than by improper handling. There are two very important points to bear in mind when selecting a brush: First, is it well made? and, second, is it good material?

Here is a fine-looking brush, with long, heavy bristles. Buy it for you? No, my lad; in this case beauty is only skin deep, and the name of the maker or recommendation of the salesman is not safe to go by. Trust only to your own judgment or to the judgment of some one qualified to buy for you. Open this brush and look at the filling. What is it? Echo answers "What?" It certainly is not good honest wearing bristles. If you soak this filling in water it will no more stand alone than a wet rag. The question whether it is hair, wood-filler, Florida grass, or what not, cuts no figure, because it water-soaks and works more like a mop than like a good bristle brush. It has a good fringe of good bristles on the outside, but they fail to do their own part of the work and at the same time furnish the spring for the worthless filling; the result is, it splits and wears to a sawtooth edge. I am speaking now of whitewash and calcimine brushes. There is not enough good stock in such a hrush, ten inches wide, to make a good three-inch wall brush, and yet they are sold at prices which ought to buy a fairly good brush. If there is any one poor brush which I despise more than another, it is a shedder, which, like a sick cat, keeps on shedding the year round. It is surprising to see how many bristles such a brush can shed and seem to grow no smaller. If you find a brush has many loose bristles in it, just make up your mind that there are more to follow, and don't buy it. Don't delude yourself with the idea that you can soak it up and make it hold. Such a brush will go back on you sooner or later. One of the most desirable things about a brush is a good point. To hold a good point, a brush must have good filling. Take, for instance, a flat-chiseled brush, its chief value is a good edge or point; but as they are usually made with all the good bristles on the outside and the poor ones in the center, the poor stuff forms the point, except a little on the corners. The soft stuff in the center will wear down faster than the good stock on the outside, and the brush will soon become a stub, unfit for cutting in colors or for anything else.

A hrush of any kind should have a good cutting edge, and to do good, durable service should have good stock in the center, because, whether ground down or chiseled by wear, the center makes the point. When the point is gone the brush is a stub, and that will soon happen when a brush is filled, like this, with short, uneven, inferior bristles. Every painter should be a good judge of a brush, and exercise his judgment, and take no man's word for it. It is well to remember, my boy, that it costs you more in time to wear out a poor brush than it does to burn it up and buy a good one. If brush-makers must use short, uneven stuff in their brushes, I prefer to have it on the outside, and the good bristles in a body across the center, to give me an even and good wearing point. We are using too many poorly-filled and badly-made brushes, which are dear to us at any price. Let us kick.—V. B. Grinnell, Painting and Decorating.

CHROME STEEL TURRETS—The chrome steel turret invented a short time ago by a French naval officer is a great improvement over previous conning towers. In its design we understand that the inventor has endeavored to avoid the weak spots that render others of a similar character perfectly worthless. Instead of merely revolving or disappearing by the aid of machinery, an operation which exposes the apertures to the enemies fire, the new cupola swings, pendulum fashion, upon a horizontal axis for ten degrees. This is accomplished hy means of a counterpoise, weighing 24 tons, which is easily kept under the control of one man. Friction is reduced by a rolling motion. A cylinder under the revolving parts fits into another cylinder, of which the surface is partly concave. When it is required to fire guns, the cupola is brought around to the desired point, and after the discharge it swings back by itself, thus putting the apertures out of sight of the enemy. The whole operation of swinging only occupies five seconds, and during two seconds only are the apertures exposed to fire. The mechanism of the cupola is said to be very ingenious, but the details are, of course, kept a close secret. The French firm manufacturing this turret first supplied a number to the Belgian government, which has used them in the fortification of the Meuse. It is now executing an order for twenty-nine on account of the Roumanian government, for the defense of Bucharest, and it is stated that the French government contemplates ordering thirty.—Machinery.

Planing Surface-Plates.

Those who have had to plane up large, flat and comparatively-thin castings, as for printing-press beds, stereotyping table-tops, etc., often find great difficulty in getting them perfectly flat and straight, the reason being that when the skin is taken off one side, the tension in which the cooling of the surface cuts the entire slab is removed, and the plate is found convex on the planed side. There is but one remedy for this—to plane only a slight cut all over the side which is to be the finished one, then to turn the slab over and take a slightly deeper cut over the back; then to bring it back with the face up and work the face the second time. By such gradual approach, coupled with proper bolting down to the planer bed, the largest plates may be made as perfectly level as is demanded. They should be tried, after planing, with a slightly bellying file, held in a special holder, and then given final finish as to surface by the scraper. In such work good surface plates should be used, and these should be tested with each other and standard, which latter should never be used except for purposes of comparison.

In this connection, attention should he called to the habit that some careless workmen have of putting surface plates, while in use, where they will get warmed up on one side or on one not more than on the other, so that they will be sprung by the heat of the sun or of the steam pipes. The more accurate a surface plate is, the more care should be taken to keep it at uniform temperature all over and, as far as possible, to have that temperature the same as that of the material which is compared with it. If a surface plate which has been lying in the sun and attained a temperature of 90° Is laid on a printing-press bed, which, by reason of being in a dark part of the shop in a draught, has only a temperature of 70°, or even 60°, the slab will cool the working-face of the surface plate and spring it out of true plane, despite its thickness or its ribs. In fact, sometimes the thicker it is, the more readily it may be sprung.

If the surface-plate has an even temperature all over, it will remain true unless laid on something hotter or colder. If it has lain in the sun face up, its face will get convex; if it has lain back up, it will get concave on the face. As most surface-plates are longer than they are wide, and tend to spring into a cylindrical rather than a spherical surface, the effect of curling by reason of unequal heating may be discovered, and to some extent neutralized in work by using them in two directions—once with their length parallel with the length of the piece being tested and again with length at right angles thereto.—Artisan.

THE GREAT CHICAGO CHIMNEY.—One of the most notable achievements in the rapidly-multiplying applications of steel to structural purposes is a new chimney of that material in Chicago, which is 350 feet in height, with an outside diameter of 9 feet 5 inches. The steel varies in thickness from 5.32 inches at the top to three-eighths of an inch at the bottom. The lower 75 feet of the chimney is lined with firebrick 8 inches deep, formed to fit the shell compactly all around, and above this it is lined with hollow tile. This lining is supported at intervals of 25 feet by an angle-iron riveted to the steel-shell; that is, the chimney is lined in a manner similar to blast-furnaces and foundry-cupolas. The steel-shell is carefully protected from corrosion by painting inside and out. The weight of the chimney is spread to the foundations in the same manner as that of the columns of the building, the foundation on which it rests consisting of first layer of cement, then two layers of steel-rails in cement and one layer of I-beams, on which the cast-iron shoe, which takes the shell of the stack, rests. The capacity of the chimney is 12 60-inch boilers, 20 feet in length. The outside diameter of this chimney is 9 feet 5 inches, while were it constructed of brick it would he 16 feet 6 inches at the hottom.

Scientific Progress.

Magnetic Field.

An air-space filled with lines of magnetic force is called a magnetic field. A magnetic field cannot exist without an inducing magnet or current of electricity. The space surrounding and in front of the poles forms the field. As is well known, lines of attraction radiate from every part of the pole. These are most numerous in front of the pole, although they spread out in all directions. That part of the field in which the lines are most numerous attracts a piece of iron most strongly, and is said to be the most intense part. The greater the number of lines of force in a given space the stronger or more intense the field. If the magnet be bent, so as to bring its poles close together, the lines of force can be shown to have become concentrated. They are no longer diffused and scattered. Their area is restricted, and the field is said to be intensified because the lines are crowded together. Hence the strongest field is that in which there is the greatest numher of magnetic lines per square centimetre or square inch, as the case may be.

The magnet setting up the field may consist of a bar or a horseshoe of hard steel. This is the only substance yet found capable of retaining a considerable proportion of the magnetism conferred upon iis molecules. Or the magnet may consist of a bar or a horseshoe of soft iron, around which an electric current is caused to circulate. The former type is called a "permanent" magnet, because it retains the polarized condition, although no magnet is truly permanent. The latter case represents an electro-magnet—a coil of insulated wire surrounding a soft iron core—but its polarized or magnetic condition rapidly decreases after the stoppage of the current.

An interresting fact has recently been brought to light with reference to steel, that an admixture of as small a proportion of manganese as 12 per cent will render steel almost indifferent to magnetism; it cannot be magnetized or attracted by a magnet.—Electrical Age.

Brass by Compression.

In a recent meeting of the Amsterdam Royal Academy of Science, Mr. Behrens dealt with specimens of brass made by compression of the constituents, at ordinary temperature, by Prof. W. Spring, Liege, Belgium. One of the specimens was of a reddish color, and had been produced by compressing a mixture of copper and one of zinc; another, pale yellow, by compressing seven parts of copper and three parts of zinc. Both specimens had been filled up twice and again consolidated by pressure. The reddish metal was a little softer than common cast brass; it could be somewhat flattened under the hammer. The yellow metal was harder than common brass and brittle. Both varieties contain a great quantity of yellow alloy, which seems to be in an amorphous state, showing a uniform, finely granular appearance, without any vestige of the beautiful crystallites, so characteristic of copper-zinc alloys obtained by fusion. Further, there were a good many angular fragments of red copper, some of them cracked and doubled up, with yellow threads between the red lumps and strands, and finally some zinc, angular fragments and threads, trending outward, and uniting near the curved surface of the cylindrical specimens. The metal is nearly, but not wholly, compact. There is much that gives evidence of a flow in the yellow alloy and in the zinc, hut nothing pointing to a truly liquid state of the alloy or one of its components. Relegation seems to be put aside, while there does not remain any doubt that zinc and copper have been intimately mixed and actually united by repeated fillings and compression. Scientists say that a more complete union of metallic powers by compression will lead to alloys of most remarkable properties, and may give some alloys that cannot be produced by fusion.

ABOUT LANTERN LIMES.—It is not generally known, says the *Optician*, that porcelain (such as an unglazed combustion tube) becomes *saturated* with hard carbon on exposure, while at the temperature of incandescence, to a hydrocarbon gas. Other porous and refractory substances can be similarly carbonized. The electric resistance, however, remains extremely high in most cases, a fact impressed on us by some experiments that were tried about 10 years ago with the object of applying such carbonized materials in electric lighting. The carbon thus deposited interstitially is, of course, strongly resistive to oxidation, but it would tend, presumably, to strengthen and bind together any very porous and friahle substructure. The suggestion has recently been made that such a carbonizing process might be applied with advantage to the cylinders of limes used in oxyhydrogen lamps. Certainly, if the durahility of the cylinders can thus be increased without detriment in other respects, a very important point will have been gained. The high electrical resistance that we have remarked is favorable, inasmuch as it implies but a trifling increase in the conductivity for heat of the carbonized material. From this point of view, the carbonized limes would be distinctly superior to arc-lamp carbons, which have also heen proposed for the same application.

Big Ammonite Blast.

A good deal of interest was taken at Newport (Monmouthshire), on September 9th, in the trial of the new explosive ammonite. The test was made in blowing down a heavy stone-wall, of 920 cubic yards capacity, dividing the Alexandra dock from an extension dock which had just been completed. The wall, which has been standing for about 20 years, weighed nearly 2000 tons. A wall containing 8500 tons, standing in a somewhat similar position, was in 1886 destroyed at the Galleons wharf, Victoria docks, London, with blasting gelatine, of which explosive 2900 pounds were employed, or in the proportion of about one pound of explosive to three tons of masonry, while in this case only one pound of the new explosive employed was used to each 20 tons. Water had been let into the new dock from the river Usk and a level made with the water in the older dock. In order to remove the wall dividing the two, it was decided to try the explosive force of ammonite fused by electricity. Charges of a hundred pounds of the compound were placed in 43 drilled holes, under the direction of Mr. Wilcox, the explosives company's works manager, and Mr. Butterfield, the chemist, and a dynamo of 110 volts was connected with the charges. Lord Tredegar, as chairman of the dock company, worked the electric switch, and the explosion which followed was considered highly satisfactory. It was not intended to demolish the wall entirely, but to so split and crack it that the masonry could easily he dislodged and removed. That result was practically attained, the wall being loosened all through from top to bottom without any damage being done to the surrounding works at the dock. Ammonite is one of the Sprengel class of explosives. It consists of ammonium nitrate and nitronaphthalene, mixed together in an edge-runner rill at a certain temperature and afterward filled into metallic cases. One of its chief advantages is that for many purposes it is perfectly harmless, and cannot be fired by ordinary concussion or even by throwing it into an open fire. Its explosive properties are only brought out in the case of a detonator containing fulminate of mercury. It is coming into extensive use in collieries where, by carefuly tamping with clay, it is possible by electric-firing to prevent the appearance of any flames, which is a distinct advantage in mines where gas is present in large quantities.—Iron (London).

A NEW METHOD OF REMOVING SCALE.—At a recent meeting of the Scientific Association of Saxony, one of the members recommended a new way of removing scale from boilers. He uses liquid carbonic acid, with which he fills a tank connected with the boiler, which is filled with cold water. The water is soon saturated with carbonic acid, and this carbonic acid water dissolves the carbonate of lime, the principal component of boiler scale, forming acid carbonate of lime. The gypsum combined with it is precipitated, and on the water being drawn off the boiler is found to be free from scale.

A VERY simple method for fastening leather to iron is to paint the iron with some kind of lead color, say white-lead with lamp-black. Leave it to dry, then cover it with cement made as follows: Take some of the best glue, soak in cold water till soft, then dissolve it in vinegar, with a moderate heat. Add one-third of its bulk of white turpentine; mix thoroughly. It should be of the proper consistency to spread with a brush. Apply it hot, place the leather on quickly and press it tightly in place.—Manufacturers' Gazette.

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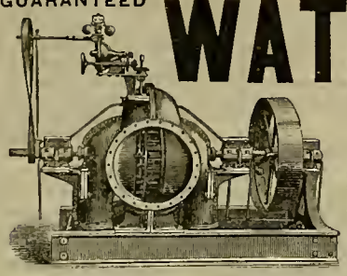

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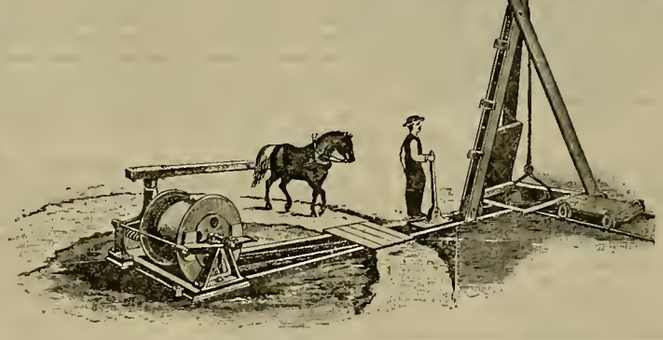

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Electricity.

Storage System Bound to Come.

A correspondent of the *Electrical Engineer* says: Advocates of both the overhead and uoderground systems are in the habit of stating that there is no prospect whatever of a successful storage battery system, or, at least, so remote is the prospect that it is unworthy of present attention. The statement is very freely made that every attempt so far has proved an unmitigated failure. There is undoubtedly a great deal of truth in this statement; but not so in the statement of there being little or no prospect of future success. Those who have given special study to this industry and have a practical experience in the actual working, together with a thorough technical knowledge of the requirements and capabilities of storage-batteries of various types, do not agree with the pessimists of the electric-storage systems as applied to street cars. There are, moreover, at the present time some very mistaken ideas among the public in general as regards the true state of the art, and also as regards the direction from which ultimate success may he first expected.

Now the public should be apprised of the fact that there is no question whatever at the present time, and has been no question whatever for years, but what storage-battery cars can run as smoothly, he as easily handled, attain the same speed, mount equal grades, stop, reverse, and in fact do all and everything equally well, and sometimes better than any other electrical system either overhead or underground. A great deal is made out of the fact of the great extra weight. It is upon the strength of an enormous reduction of this said weight that inventors and advocates of the numerous so-cal'ed "entirely new and improved storage systems" attract their patrons. In some cases a certain reduction of weight may be made, hut it is usually at the sacrifice of stability and strength. As a matter of fact the subject of reduction of weight is not nearly so important as the public is led to suppose. A reduction of 50 per cent of battery weight would, on an average, mean a saving of 10 per cent of total weight upon a car capable of seating from 30 to 40 passengers.

Thus with the facts before us that a storage-battery car can do all and everything as well and perhaps better than any other electric car and that the weight is an overrated objection, it may be justly asked, why have they not been successful? The answer to this is very simple. Because hitherto the cost of operating—in consequence of the depreciation of the batteries themselves—has been too high. The cost of prime motive pnwer is less with storage-batteries than without. Now, the only way of proving the success of any storage-car system is, in the first place, for the owners to make a contract with some good representative streetcar company, by which said owners undertake to operate and maintain their batteries in proper working order upon a fair number of cars at a fixed price per car mile.

If such a contract is taken at a price satisfactory to the car company, this is the first step toward the required proof. If at the end of the first term the contractors are ready to renew said contract on same or equally satisfactory terms, having by their previous operation given sufficient satisfaction to the car company to warrant such a renewal, then we come to the second and very important step toward the final proof. The last and most important step is for the contractors to prove that they are operating on a profitable hasis. This can be shown by their books or their willingness to take further contracts upon the same terms.

Numerous contracts of the above nature have been made and started upon. Some have resulted, so far as they went, in the satisfaction of only one party to the contract, usually the car company. In others, again, there has been general dissatisfaction all around. In all cases, however, difficulties and disagreements have arisen at the second or third stage of the drama, namely the renewal and extension of contracts. Numerous excuses have been made, the principal of which is lack of funds. For ample funds there must be ample faith. It is the lack of faith that has produced the lack of funds. All these contracts, however, no matter how short a time they may have lasted, have resulted in some good, namely, the acquiring of practical experience as to the requirements in actual working. Each so-called experiment has been one step ahead. It is from those who have been thus steadily working ahead in this field that the long-wished-for result must he looked for.

Those who have devoted many years of study and close attention to this special subject, as a rule do not expect to see the sudden solution of the problem arise from some great and unexpected discovery. Of course it must not be denied there is a possibility of something new and unexpected suddenly coming to the front; but the possibilities of such appear greatest to those who have the least knowledge and experience in this branch of science. Most scientists will probably agree that it is to the developments and imprnvements which have resulted from continued study and experience of present systems that we must look for the solution of the problem.

As a last question which a patient public may justly ask: How soon may this long-looked-for and long-wished-for result be expected? It may be stated in reply that in all probability even the next few months may show some decidedly encouraging advances. Contracts such as described above have been entered into hy experienced and substantial firms. The contracts are now entering upon the second stage—namely, that of renewal and extensions. These are heing watched with the utmost interest, as apparently at no previous occasion have the contractors been in a more substantial position and with a hetter knowledge of their subject than at the present time. Results so far give every promise in the very near future of a practical proof beyond all question that the storage system is bound to be the system by which the problem of rapid transit is to be solved.

Electrolysis and Lead Water Pipes.

In a recent number of the *Electrical World* attention was called to what was supposed to be a case of damage to lead water-pipes by the electrolytic action of a street-railway current. This case was in the city of Saginaw, Mich., where a lead pipe ran for some distance parallel to the electric railway. On taking up the pipe, it was found to be seriously corroded at numerous points, its appearance being similar to that of a worn-out storage-battery plate. Since the presentation of this case in our columns, our attention has been called to a very similar occurrence in the city of Athens, Greece. Mr. Etienne de Fodor, the manager of the Athens central station, informs the *World* that the neutral wire of one of their circuits was grounded by connecting to a lead pipe nearly a mile in length and two inches in diameter. Trouble was experienced by the failure of one of the lead-covered cables, which showed a series of small pinholes apparently resulting from the gradual disintegration of the lead-sheathing. This failure occurred upon both the positive and negative mains of the three-wire system. It was soon discovered that the water-pipe to which the neutral was grounded was leaky, and an examination showed that the entire pipe was filled with a series of small holes similar to those found in the sheathing of the lead-covered cables. At several points the water-pipe was in contact with flowing water, and at these points it was found to be uninjured; but wherever it touched damp masonry, and was not in contact with running water, the perforations mentioned above were found, the metal at these points being badly oxidized and crumbling at the mere touch.

Chemical disintegration was especially noticeable at the soldered joints of the water-pipe. Investigation showed that other lead pipes placed in the same channel, hut not connected to the return circuit of the electrical conductors, exhibited no trace of injury; and this, together with the fact that the pipe was badly damaged at the point to which the conductors had heen soldered, was taken to indicate that the disintegration of the metal had been caused hy the electrical current. Another point which seemed to strengthen this view was the fact that wherever the pipe was surrounded hy flowing water, scarcely any damage could he detected, and this was attrihuted to the presence of a small amount of oxygen in the flowing water. The result of this experience in the Athens central station has been to lead the company to helieve that the grounding of the neutral wire in three-wire systems is not to be recommended. The managers helieve that an entire system constructed in this way would tend to increase the danger from short circuits rather than decrease it. If any of our readers have had similar experiences of this kind, we should he glad to have them brought to our attention. So far as we are aware, the case noted at Saginaw, Mich., and this one at Athens are the only experiences of this kind that have ever received puhlic attention.

TRAIN-LIGHTING BY ELECTRICITY. — The successful working of the electrically-lit train on the London, Brighton & South Coast railway seems to prove that electricity can readily he adapted for service in this direction with advantage. The axle of the guard's van drives by means of a belt a small dynamo placed in the guard's van which charges accumulators. From these accumulators wires run to all parts of the train, and a light is maintained in a fairly constant manner. The speed of the dynamo varies considerably according to the rate at which the train is traveling, hut by an automatic arrangement the machine hegins charging when the train is going at about four miles an hour and cuts out when below this speed. In case of an accident to the train, the wires would be simply broken, and all danger of fire at an end. It is stated that to light an ordinary train by electricity an expenditure of about two-horse power extra is required from the engine. Dynamos to give a constant voltage with large variations of speed are well understood, and it is this knowledge which makes the utilization of power of variable nature at the present time quite possible. Thus windpower, which in this country is so very unreliable, may be now employed, which a few years ago would be out of the question. The fact is, the dynamo is so well worked-out that machines can be supplied to suit all possible requirements. Thus to the ordinary types of series, shunt and compound machines, must be added dynamos to give a constant voltage or constant current with varying speeds. A windmill can thus drive a dynamo within the wide range of 500 to 1500 revolutions, and still keep the pressure sufficiently constant to charge accumulators, although, of course, at widely different rates. The dynamo may now be considered the most perfect generator of power, and it has practically grown to its present advanced position in less than 20 years.—Machinery (London).

Improvements in Electric-Traction.

At the annual meeting of the Street Railway Association of the State of New York, an interesting report was made by the committee on "Recent Improvements in Electric Traction," which is published in full in the *Electrical Age*. From this we make the following extracts:

Electric systems as first constructed were built on altogether too light a plan, and the increasing tendency year by year has been, and is, for heavier and more solid construction in every department, but particularly in the way of track and station equipments. It has been well said that no new departure is ever perfect at the beginning, and no one realizes this more than he who has watched the development of electric traction during the last few years.

The storage-battery has made but little progress duriog the past year, and is not likely to cut much of a figure in electric traction until it is able to make a better showing, financially, than it has in the past.

The general tendency of the times to consolidate all common interests under one management is showing its effects in electric traction more now than ever, and scarcely a week passes that we do not hear of some syndicate obtaining control of some horse-road, and the information usually ends with the statement that "it is intended to equip all the lines with electricity." From many points of view this is an improvement, and a marked one.

Probahly the greatest advance in any particular line has heen in the matter of armatures for motors and dynamos. The "iron-clad" type will do more toward reducing the hill for repairs in that direction than any other one thing that has been introduced during the year. The electric companies have adopted this form as their standard.

In the manner of controlling the motors, most of the companies still use the time-honored rheostat, although one company is endeavoring to introduce a new type of controller.

Many roads, acting under a misapprehension of the requirements, started off with motors too small for the work, and endless trouble has heen the result.

There has heen a general improvement in all parts of the overhead material. We are using stiffer poles, stronger span wires, better trolley-wire insulators and more handsome curve-fittings, so that the general appearance of the system is much pleasanter. The quality of insulation now in general use is far superior to what we had two years ago, and as double iosulation is now employed on the span wires, very little trouhle from leakage is experienced.

The power station may be rightly called the heart of any electric system. The trolley and feeder-wires form the arteries, the rails and return-wires the veins, and the cars the capillaries connecting them. The hihlical injunction to "Guard thy heart with all diligence, for out of it are the issues of life," would certainly seem applicable to the station. The chief element to be considered should be reliability, and after that, economy. Just what means shall be used to attain this end seems so far to have been a disputed matter, as shown by the stations now in operation, which contain almost every conceivable device—good, bad and indifferent, all shapes, sizes and descriptions of engines, boilers and dynamos. Many designers of stations—if some of them can be said to have been designed at all—seem to have gone at their task utterly regardless of the future and oblivious to the experiences of the past. However, through it all, a very marked improvement is observable lately. The designers of stations are learning wisdom from their past experiences, and the makers of apparatus are more alive to the requirements of the system, and better material and workmanship can be had where required.

The recent introduction of large multipolar dynamos has brought about a change in station arrangements not heretofore obtainable, and in all large stations now being built, countershafting is dispensed with entirely, and the general tendency is toward reduction of parts, which in turn means simplicity. It is very probable that we have reached now a form of station that will be fairly permanent, and the main point in the future will be the size of the units. For medium-size stations, engines with releasing-valve gear belted direct to a multipolar dynamo will be the best where the price of land is not excessive, and direct-coupled engines and dynamos for larger stations. There have been no comparative tests made as to the economy of the various types of stations, although all reasoning would point to these latest types as heing by far the most economical.

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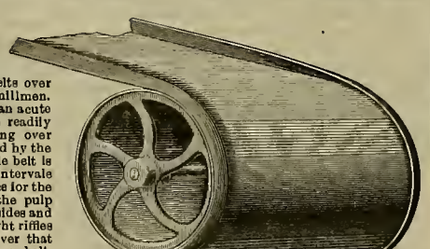
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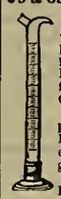
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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings, and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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Useful Information.

How Shellac is Made.

What makes your derby stiff? Shellac. What is sealing-wax? Shellac principally. What is shellac? It is the prodnct of a composite mass that is fouod on the young twigs and brancbes of the hutea, croton and other trees that grow in the countries of the East. Shellac is coosumed in great quantities all over the world in commerce and in arts. It is kept in the shops and large warehouses in large hogsheads. It varies in color and thinness and is transparent. It comes in broken pieces of irregular sizes, some of it beiog very thin.

The crude mass from which shellac is obtained is produced by a small insect (Cocars lacca) resembliog somewhat the cochineal. The insect is hatched, matures and dies on these twigs. A number of female insects, with a few males, fasteo themselves upon the tender twig and puncture the hark. A tenacious fluid exudes and envelops them. The insects feed upon the juice, derive their nourishment from it and deposit their eggs within it. The males only have wings, and as soon as the females begin to die a few females and the males go to other trees. After the females that remain io this gelatinous mass have deposited their eggs aod have died, the eggs hatch out the young insects. The young burrow through the dead bodies of their mothers to the surface of the mass and then cover the neighboring branches. The eggs are deposited close to the bark, so that they are protected by their mother's bodies and by the mass that has exuded and enveloped the female iosects. Finally the young twigs are completely covered with a tbick, bard, resinous substance. When the females die the frames of their bodies form little cells like those of a honeycomb. As a result of decomposition there are the elements of a beautiful purple dye.

When these twigs have been sufficiently loaded with the resinous mass, tbe natives of the countries in which these trees grow, strip the trees of these twigs and break them into small sticks. These pieces are called sticklac. These broken twigs are immersed in hot water and the hot, resinous substance is kneaded by the haods to press out the purple dyestuff. After the gelatinous mass has become sufficiently soft it is taken out and dried. It is then put into coarse cloth bags and suspended close to the charcoal fires. Presently the mass hegins to melt. By twisting tbe bags the mass is squeezed out, dropping onto flat sticks placed for that purpose. As it is dropping from the bags it hardly strikes the sticks hefore it is cooled by tbe air. It forms into thin cakes as it is deposited on these sticks or narrow, flat boards and dries. These cakes or sheets are called shellac. As the melted mass is dropping from the cloth bags, small drops unavoidably fall to the ground and dry in litttle, round bodies called cottonlac. Other and larger pieces that also fall to the ground and dry are called platelac.—Boston Globe.

Finishing Oak.

The most fashionable method of finishing woodwork in the natural color of wood, according to A. P. Daire, is to use what is known as "quartered oak" for the panels. This is oak cut in a certain way so as to show the grain in the most variegated and attractive manner. This is then finished in either the antique or natural method. The finish of what is known as "antique oak" is produced in the following manoer: The job should be made of hard wood, witb as full ao open grain as possible to secure a fine effect. Sandpaper this and cleao off. Then prepare a priming made of 1 part japan, 1 part raw linseed oil and 1 part rubbiog varnish. Drop into ½-gallon of the liquid 1 pound of commercial cornstarch, such as is used for culinary purposes. Next take some good, dry, burnt Turkish umber, and add about ¼-pouod of this to the starch. Apply to the job a good flowing coat of this priming. Let stand until it is set and has soaked well ioto the grain, and then take a broad putty knife and slick it into the grain, working the knife crosswise of the grain. Again let stand a little while, and then wipe with rags; especially, clean out all the corners and get the job into as good condition as possible as regards having the grain well-filled.

Upon the completion of the operation above-described, it will be found that the open grain has absorhed tbe starch and umber, and that these portions now show the dark shade suggestive of age, while all the rest of the surface is also slightly darkeoed.

When again perfectly dry, give one coat of rubbing varnish, prepared hy adding to it ½-pound of starch to each gallon of varnish. This coat should be flowed on freely as a medium coat of rubbiog varnish, but he careful not to have runs or sags. This ought to completely fill the wood, after which proceed to varnish, rub and fioish the joh io the usual manner. To produce a natural oak finish, follow precisely the same course as above-described, with the single exception of omitting the umber. This will leave the wood in its natural color.

Polishing Wood with Charcoal.

A method of polishing wood with charcoal, now much employed hy Freoch cabinetmakers, is described in a Parisian technical journal. In this cosmopoliton city may be seen many articles of furniture of a beautiful dead-black color, with sharp, clean-cut edges and smooth surfaces, the wood of which appears to have the density of ebony. As against furniture reodered black by paint or varnish, the difference is so sensihle that the great margin of price value between the two kinds of work explains itself. The operatioos are much longer and more minute io the case of charcoal-polishing, which respects every detail of carving, while paint and varnish would clog up the holes and widen the ridges. In the first process, only carefully selected woods are employed, of a close and compact grain; they are covered with a coat of camphor dissolved in water, and afterward with another, composed chiefly of sulphate of iron and nutgall. These two compositions, in blending, penetrate tbe wood giving it an iodelible tinge, aod at the same time rendering it impervious to the attack of iosects. When sufficiently dry the surface of the wood is rubbed at first with a hard brush of couch grass and then with charcoal of substances as light and pliable as possible. Aoy hard grains remaining in the charcoal scratches the surface iostead of rendering it perfectly smooth. The flat parts are then rubbed with natural stick charcoal, and the indented portions and crevices with charcoal powder. Alternately with the charcoal, tbe workman also rubs the furniture with flannel, soaked io lioseed oil, and essence of turpentine. Repeated pouncings cause the charcoal, powder and oil to penetrate into the wood, giving the furniture a beautiful color and also a perfect polish without any of the flaws of ordinary varnish.

THE CARE OF THE EYES.—Not long ago an advertisement was read in which an optician promised to examine the eyes of all who came to him *free of charge*, and to provide glasses for the same at moderate rates. The object of this free examination was evidently to provide customers for the sale of the glasses and spectacles. The advertiser may have been a skilled oculist, and perfectly able to provide for the needs of his patients, but is it worth while to make the experiment? Any ooe who has ever been threatened with blindoess will protest against running any risk in the treatment of tbe eyes. Sight is the most blessed of all of the five physical senses. Blindoess, or the thought of blindness, seems like a living death, and only tbose wbo have experienced the fear can understand it. Do not take any risks with your sight. Do not experiment or allow others to experiment with your eyes if they are weak or failing. Economy of money at the risk of losing your eyesight is foolishness. The eye is one of the most delicate of organs, and easily ruined and the sight destroyed. There is no excuse for negligence in the matter; there is no use to try home or cheap remedies. If your sight is failing, if your eyes are out of order, hesitate not for a moment, but consult a competent oculist at once, and seek oone but the best. Sight is too valuable and precious to be trifled with. Those who have suffered will tell you the misery eotailed. There are hospitals where the eyes are treated free in many cities by the best oculists, so it is not a question of money. And the warning cannot be repeated too often—do not trifle with your eyesigbt under any consideration.—Harper's Bazar.

NEW METHOD OF TIN-MINING IN THE MALAY PENINSULA.—Mr. Leech, an official in Perak, in a receot report described a new method of tio-mining which is being adopted in that State. He says that the system of mining in Kinta during the last year has completely changed, owing to the introduction into general use of short wash-boxes, called by the natives "lanchut kechil." Up to the end of 1890 they were hardly known; now they are used everywhere. The wash-box employed formerly was 30 feet long and could only he used with a considerable head of water; a 6-inch steampump could only keep two boxes going, and, as a natural consequeoce, only land in the neighborhood of large streams of water, or in which the owners could afford steam or waterpower pumps, could be worked. Considerable capital was therefore necessary to open a mine, and the only part of the land worth washing was the karang, or rich tin deposit, found at a depth of from 10 feet to 50 feet below the surface. The introduction of the lanchut kechil has changed all this. The box itself is but 8 feet long, and costs about 17s. It can be put up wherever there is a pool of water; instead of requiring a steam-pump, it can be supplied with water by one man ladling with a kerosene tin, and, instead of large sums being spent on strippiog the surface-soil before the karang could be reached, the surface-soil itself is now washed in the lanchut kechil, the same water being used over and over again.

THE PRICE OF PLATINUM.—It is reported that the recent scare as to the scarcity of platinum was got up for a purpose, and that the increase in price was due to a combination between the English handlers of the ore and a hroker in St. Petersburg, who together controlled the production aod got up a "corner" in this article. The increase in price has, however, provoked competitioo, and several new mines have now been opened, whicb bave increased the production considerably. There are now at least 40 mines at work along one river, but the plant employed is of a very primitive character. Some of the mineowners have now introduced steampower, but at present the sand is not purified at the works, but sent to an establishment in Germany where it is prepared for the market. The yield of crude platinum for the year 1891 from the Ural provinces exceeds 9000 pounds, or 50 per cent more than the returns for tbe previous year.—American Manufacturer.

IT has been discovered that the first patent granted to an inventor in America, was to an Englishman named Joseph Jenks. An act was, it appears, passed in the year 1646 by the General Court of Massachusetts Bay according to this person "the exclusive right of making and selling his improved scythe for the term of fourteen years." The decree was, therefore, promulgated exactly 26 years after the "Mayflower" had landed its burden at Plymouth, in the State which was afterward destined to witness the commencement of the American War of Independence. The improvement protected by Mr. Jeoks' letters-patent is stated to bave consisted in changing the short, thick, straight English scythe into the longer, thinner, curved instrument with stiffened back.

GUNPOWDER is a force that acts so quickly that it may be taken for a blow from a sledge-hammer. A fly-wbeel was to bave been removed from the end of a shaft, and, to make the work as light as possible, another wheel from the waste pile was placed alongside of it on the shaft, and a seam charge of powder exploded between these hubs. It is now thought that if a strain could have brought upon tbe rim of the wheel by ropes extendiog in the direction of the shaft, this wheel might have been available for further use. As it was, the hub moved too far for the spokes to spriog such a distance without baving some assistance from the rim of the wheel.—Boston Journal of Commerce.

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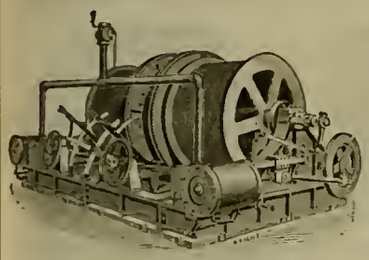

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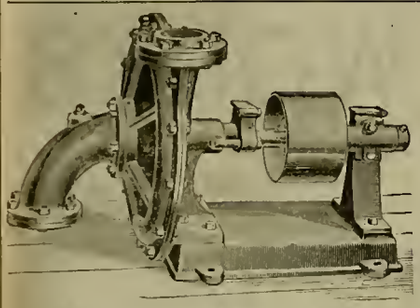

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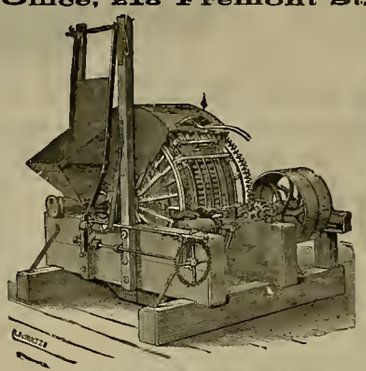

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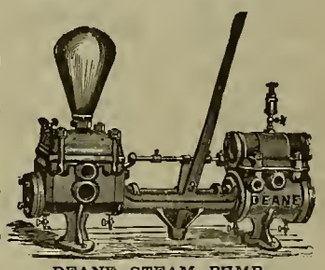

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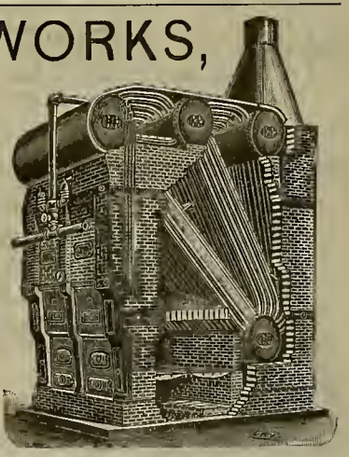

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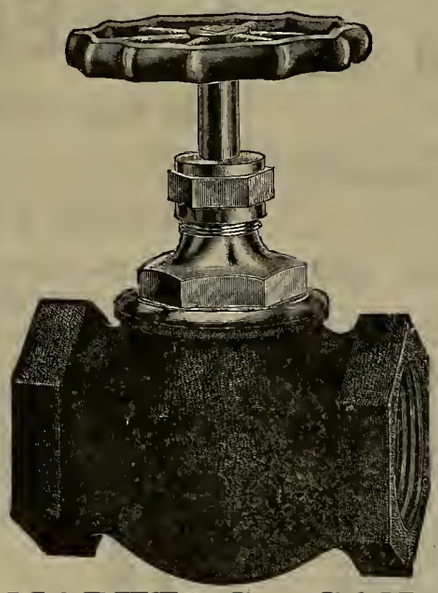

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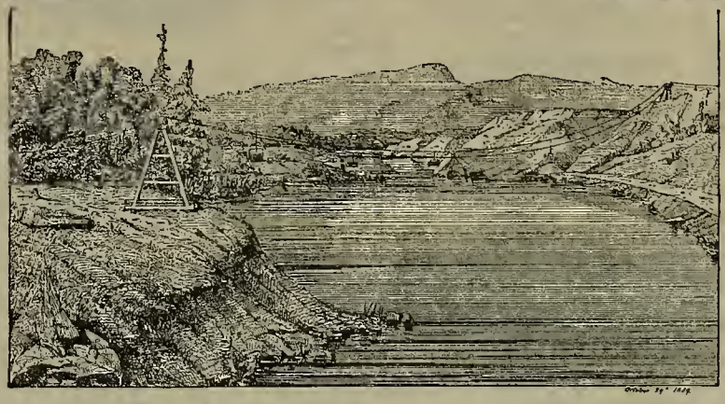

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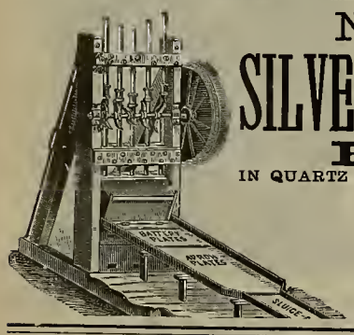

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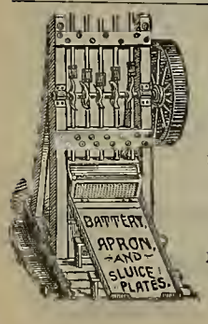

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

AMADOR QUEEN.—*Ledger*, Oct. 22: Mr. Holland, who has had a crew of men at work in the Amador Queen No. 2 for two weeks, getting out a carload of rock to take to San Francisco, finished up the work Wednesday night and went below. The rock will be hauled to Ione, and shipped by rail as soon as possible. He proposes to give it a thorough test, and will, if the returns are satisfactory, in company with others, secure the property.

SUTTER CREEK.—All necessary preparations for sinking in the South Eureka are about completed. They are doing a little exploring at the 1500-foot level, which will be through by the 1st, then sinking will be in full blast. In the Wildman the air has been exceedingly bad for some time. The miners have been obliged to abandon work temporarily in consequence. Mr. Tregloan has had a new blower, much larger than the one previously used, sent from San Francisco. It is much more effective than the old one.

THE OUTLOOK.—*Record*, Oct. 20: The mining outlook in this section and county is certainly encouraging. As near as the *Record* is able to judge, it has not been more flattering for a number of years past. Sutter Creek people particularly have every reason to regard with satisfaction the condition of the mining industry in this vicinity, and unless all signs fail, our town is to enjoy more than usual prosperity in the future. The starting up of the Hector 40-stamp mill and the fine outlook in the underground workings of the mine, is a cause for congratulation. The Wildman mine, with its 30-stamp mill crushing steadily, under the capable management of Superintendent Tregloan, is an old standby and is upon a solid and permanent basis, which will continue to add its share toward keeping our beautiful little city in the front rank. As the *Record* has stated many times during the past two or three months, the South Eureka mine is rapidly developing into a valuable property, and its owners are sanguine that another season will see the mine turning out ore with a big mill erected for its reduction. The developments on the 500 level are entirely satisfactory, which is evidenced by the fact that sinking is to be resumed until another 500 feet is attained. Superintendent Tibbits is pushing ahead work as rapidly as possible with a small force of men at the Belmont mine. He is anxious to go to a greater depth, and doubtless the present favorable mining indications on all sides will encourage his company to inaugurate work on a more extensive scale. In connection with the mines, and also an important factor in the business welfare of our town, is the well-known foundry and machine shops of Knight & Co. This is one of the most extensive establishments of its character in the mining sections of California, and does much to encourage the development of mining, as every kind of machinery for that branch of industry is manufactured. The advantage of having that sort of work done under the eye and in the vicinity is an item not overlooked by men who make a business of mining. At our neighboring town of Amador City are the South Spring Hill and Keystone mines. Both of these properties are old dividend-payers, and they have done much toward keeping Amador on a level with its neighbors. The Kennedy mine, only a couple of miles from here, on the Jackson road, is one of the best gold mines on the continent, and is very good evidence of what the reward is for those who go down, down, down on the mother lode in old Amador. There are several good mining properties in this district lying idle, but doubtless they will be operated in good time. As at present situated, the people of Sutter Creek ought to feel pretty well satisfied with the outlook for the future.

Butte.

HUALETON MINE.—Oroville *Mercury*, Oct. 22: Some time ago Capt. Frary bonded the Phœnix quartz mine from the McMillan brothers, and has recently sold it to G. S. Colman of Chicago, and the gentlemen are all in town to-day to close the trade. During the past few months considerable development work has been done, and the ledge has proved remarkably rich. Mr. Colman will go to work on the property immediately, and will no doubt develop a rich mine. Capt. Frary is at work on other mines in the vicinity and will no doubt make more sales. W. W. Stow has a quartz ledge about two miles from Hurleton and has eight or ten men now developing the same. He is also building a road to the mine, and altogether the outlook for the mines about Hurleton is exceedingly bright.

Calaveras.

GOOD HOPE MINE.—Calaveras *Chronicle*, Oct. 22: Work is being actively pushed on the Good Hope mine, situated on the Mokelumne river about two miles from this place and owned by J. H. Jacobs & Co. There have been two tunnels run in on the lead for a distance of 60 feet, in both of which the rock shows well. Wednesday we were shown a piece of sulphuret rock that was taken from what is known as the "Pink Smith" shaft, that is said to be very rich. The rock was taken from a depth of 75 feet, at which point the lead was about 15 inches wide. The prospects are flattering for the development of a good piece of mining property.

El Dorado.

CANYON CREEK MINE.—Georgetown *Gazette*, Oct. 22: If the Caminetti Mining Bill becomes a law and hydraulic mining is resumed, capitalists stand ready to take hold and open the Canyon Creek mine, which will give employment to a large number of men.

NEVADA.

Nevada.

MURCHIE.—Grass Valley *Tidings*, Oct. 21: The Murchie mine has been bonded for $25,000. Parties are now at the property who will make arrangements to start up the mine shortly.

Siskiyou.

QUARTZ.—Yreka *Journal*, Oct. 19: Andrew G. Myers, the well-known mining man, who has an interest in an abandoned quartz ledge at Oro Fino, recently relocated, showed us a fine specimen of quartz from the ledge which contained solid gold in considerable quantity, and of bright yellow color. He took the specimen to San Francisco for exhibition, with the intention of also taking it to New York. From ten wagonloads of quartz crushed in an old arrastre, $300 was realized, but a single wagonload of the specimens shown would pay more than that, and it may be possible that a great amount of such quartz may be realized when the claim is better developed. Quite a large number of quartz claims is being located in the Siskiyou mountain foothills this fall, and by next spring, when the snow of winter disappears, there will be hundreds of miners employed in developing rich ledges. The rich strikes made by the Oregon Co. near Coles has caused many other Oregonians to come into our county and invest in mining property along the Oregon border. The Klamath river miners between Henley and Honolulu are now reaping a golden harvest, which will continue steadily until winter storms raise the river to drive them out.

Washoe District.

CONE, CALIFORNIA AND VIRGINIA.—*Chronicle*, Oct. 22: 1100 level—The west crosscut from the main north lateral drift, 315 feet north from the shaft station, has been advanced 30 feet; total length 288 feet; in porphyry and clay, carrying streaks of quartz. 1500 level—From the south drift at point of connection with the old stopes we continue to extract some ore and fillings of average milling value. 1600 level—We have continued prospecting upward from the old sill floor of the old stopes, from which some ore of fair quality is being extracted. 1650 level—Continued to extract some ore from the drift run east from the winze No. 3 (down 73 feet) in working upward from that point. Also some ore from the old stopes at the north end of the California ground. From the crosscut run west from the northwest drift we are running north in the old stopes and extracting some ore. 1750 level—Have continued to extract some milling ore in working upward from the sill floor in east crosscuts Nos. 1, 3 and 5 from the main south drift, and from the point where the upraise from the end of the drift run south from the end of the crosscut run west from the end of the main southwest drift connects with the 9th floor openings. Are extracting ore along the drift which connected this upraise (45 feet up) with the upraise 44 feet east. On the sill floor, at the bottom of this last-mentioned upraise, the south drift has been advanced 22 feet; total length 52 feet; in a quartz formation, carrying a low assay value. Have continued making repairs to the southwest drift. 1800 level—Along the south end of the drift running south from the crosscut run east from the winze No. 1 sunk from the 1750 level, we have continued to extract some ore from the sill floor upward of milling value. In stoping upward from the drift run south from the crosscut run east from the bottom of winze No. 2, down 45 feet, have extracted some milling ore. There has been extracted from all parts of the mine during the week 975 1830-2000 tons of ore which was shipped to the Morgan mill, the average value of which, per car samples, was $27.11 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $22.64 per ton per battery samples.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, the west crosscut No. 2 has been advanced 19 feet; total length, 168 feet; in porphyry and clay carrying a little quartz of nominal value.

UNION CON.—900 level—The joint Union Con. and Sierra Nevada west drift has been extended during the week 25 feet; total length west from the joint shaft, 2534 feet. The face is in porphyry and small streaks of quartz.

MEXICAN.—On the 1465 level the west crosscut, started from the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 14 feet; total length, 168 feet, continuing in a hard porphyry formation.

UTAH.—340 level—The north drift from west crosscut No. 2 has been extended 18 feet; total length, 114 feet, continuing in porphyry, clay and quartz formation.

SIERRA NEVADA.—West crosscut No. 2, from Kenosha tunnel, started from north drift, 800 feet in, has been advanced 24 feet; total length 248 feet; face in black porphyry. Cedar Hill drift has a total length of 53 feet; the face is in porphyry. The intermediate tunnel between the Cedar Hill drift and Kenosha tunnel has been advanced 15 feet; total length 52 feet; face in soft porphyry. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 25 feet, making the total distance west of shaft 2534 feet; the face is in hard porphyry and small streaks of quartz.

ANDES.—On the 420 level, east crosscut No. 1 north was advanced 12 feet; total length 181 feet; formation porphyry and clay. This drift is being timbered as it is advanced.

GOULD & CURRY.—200 level—The northwest drift, started 435 feet from shaft, has been advanced 14 feet; total length 496 feet; face in hard porphyry. West crosscut No. 5, started in northwest drift, 432 feet from main west drift, has been extended 15 feet through porphyry and quartz; total length 41 feet. On the Sutro tunnel level, the joint north drift with Savage Co. has been advanced 25 feet during the week; total length 610 feet; face in porphyry.

BEST & BELCHER.—900 level—All work on this level during the week has been on repairs.

HALE & NORCROSS.—We continue retimbering main shaft above the 1000 level. Main Incline—Are making the necessary repairs. 1300 level—Are repairing the station at bottom of vertical shaft. 1500 level—Are repairing the incline station on this level and making other repairs. 1800 level—During the week advanced No. 1 west crosscut 13 feet; total length 75 feet; face in porphyry and quartz. West crosscut No. 2 on this level was advanced 12 feet; total length 58 feet; face is in quartz and porphyry. Advanced west crosscut No. 3 17 feet; total length 50 feet; face in porphyry. The west drift on the 150 level of the old or A-street workings was extended 4 feet; face in porphyry. The upper portion of the shaft for these workings was timbered during the week.

CHOLLAR.—We are making repairs on the various levels. The east crosscut, 160 feet south of north line, 930 level, is out 160 feet; face in soft clay and porphyry.

POTOSI.—The raise from No. 1 crosscut, 1100 level, continues in 2½ feet of fair-grade ore. Have started an east crosscut, 50 feet south of the Potosi winze, 1150 level; face in low-grade quartz. The southeast drift from bottom of Potosi winze, 1850 level, is out 169 feet; face in porphyry. The northwest drift from the 1800 station, Ward shaft, is out 988 feet; face in clay and porphyry. Extracted and sent to mill the past week 379 1900-2000 tons of ore from the 550, 1150 and 1300 levels. Milled during the week 400 tons. On hand at mill 57 1100-2000 tons. Average battery assay, $19.96. Average car sample assay, $20 69. Shipped to Carson Mint 384 pounds of crude bullion.

BULLION.—The north drift, from top of raise from east crosscut, 320 feet south of north line, 1300 level, is out 102 feet; face in porphyry and streaks of quartz. The joint southeast drift from the bottom of Potosi winze, 1850 level, is out 169 feet; face is in porphyry. The northwest drift from 1800 station, Ward shaft, is out 988 feet; face in clay and porphyry.

WARD SHAFT.—The joint Alpha and Exchequer east crosscut, 1800 level, has a total length of 40 feet; face in hard porphyry. The joint Potosi and Bullion northwest drift, 1800 level, is out 988 feet; face is in clay and porphyry.

EXCHEQUER.—The joint east crosscut on the north line of Alpha, 1800 level of Ward shaft, is out 40 feet; face in hard porphyry.

ALPHA.—The joint east crosscut on the north line of Alpha, 1800 level of Ward shaft, is out 40 feet; face in hard porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extracted and milled 175 tons of ore of the average value of $18.40 per ton as per battery samples. The main north drift on the 750 level has been extended 8 feet; face in low-grade ore. The Zadig drift, Sutro tunnel level, has been extended 12 feet in hard porphyry.

NEW YORK.—The west crosscut, 110 feet north of shaft, 800 level, is out 43 feet; face in low-grade quartz. During the past week we have hoisted 77 carloads of ore from the 650 and 750 levels, that will average about $40 per ton.

SILVER HILL.—We are stoping out ore on the 160, 260 and 490 levels. Have extracted and sent to the mill the past week 195 375-2000 tons of ore. Milled during the week 195, 375-2000 tons of ore. Average battery assays, $19.76; average car sample assays, $23.01.

Ferguson District.

MAGNOLIA.—Pioche *Record*, Oct. 18: Monday's Helene stage brought up word of a new and very important strike which had just been made in the bottom of the Magnolia main shaft. The ore-body had been opened to a width of four feet and the grade is said to far exceed in richness the ore taken from the workings above. James Hutchinson brought up a number of large pieces which are said to range in value from $1000 to $5000 per ton in gold. The present strike is claimed to be the largest ever made in this State, and is more than encouraging to the purchasers of the mine.

THE APRIL FOOL.—Monday's *Lode* says the main shaft has now attained a depth of 112 feet. The south drift, started last week, has been run ten feet. This drift is for the purpose of crosscutting to the footwall, which has not yet been reached. The north drift is on the ledge. It has been run about ten feet in good ore. The No. 2 shaft has been sunk 25 feet in ore which averages very well. Two shifts are being worked on all parts of the mine, and prospecting is being pushed as rapidly as possible.

Pioche District.

THE YUBA.—Pioche *Record*, Oct. 3: A force of from 12 to 14 men is employed on this mine, strengthening the shaft timbers and otherwise putting the mine in good shape. How long the force will be retained is not known. The rumor of two weeks ago that the mine was to be leased has not materialized, and it looks as though the mine may lie idle for a time at least.

Pittsburg District.

THE MAYFIELD.—Virginia *Chronicle*, Oct. 21: Richard Kirman, from the Pittsburg mining district, Lander county, is owner of the Mayflower mine, half a mile above the Pittsburg, and has been working out there during the past five months. The gentleman has been engaged in building a road and fixing his mill, and has 14 men employed. He has a double Huntington crusher, which was moved to Mayflower from the Atlantic mill below Gold Hill. Mr. Kirman brought back many specimens of rock from the mine, some of which are speckled with native silver and assay 116 ounces to the ton. The ore is free-milling chloride. Mr. Kirman is elated over his prospects, but will not start the mill until next spring, owing to the price of silver.

COLORADO.

YANKEE GIRL.—Denver *Mining Industry*, Oct. 20: The Yankee Girl of Ouray county, during its past fiscal year, sold 4083 tons of ore, which averaged $36.12 per ton, and the net result was a loss of $33,596.50, or $8.22 per ton. To meet the loss and provide for the future, the company issued $50 000 in bonds. The mine is looking better than it has for a year, and gives promise of again becoming a profit-payer. A new discovery of rich ore has been made near the surface, about 200 feet from the shaft northeast toward the Guston, and it promises to yield well.

WORKING over dump-piles is one of the regular occupations in Colorado. One of the latest ventures of the kind is the Guston dump of Ouray county. It yielded $40,000 net.

THE following statement from the report of a committee we copy from the *Mining Industry* as showing the effect of the low price of silver: Number of mines closed down in San Juan county, 18; number of men thrown out of employment, 595; number of mines that reduced their forces, 6; number of men thrown out of employment thereby, 268; total number of mines affected, 24; total number of men disemployed thereby, 863.

PITKIN COUNTY.—Aspen *Sun*: The Durant tunnel will be completed about the 20th of this month. It is to be supplied with the finest electric plant in the State. There is an unusual quantity of ore now being shipped from the Aspen contact. Nine four-horse teams are now employed hauling ore from the mines. At a depth of 200 feet it is intended to crosscut and drift to catch the contact. All the ground above the tunnel level, a distance of 250 feet to the surface, in the Leadville mine is to be let under contract. Manager Yeckel says that the shaft is being sunk at the rate of about 4 or 5 feet a day, and it will be pushed down 200 feet more, when it is intended to strike the contact by crosscutting.

RICH MINE.—Aspen *Times*: The Mollie Gibson is displaying her jewels again this month, and is marketing some of the richest ore that ever studded the earth. It is no longer a question of capacity with this bonanza that has thrown the sensational records of all the past into obscurity, but simply how much will be thrown upon the market in its present depression. It is as possible for the mine to produce a half-million a month for an indefinite period as it is to produce a hundred thousand. The fortunate lessees of the Eva Belle sent down a certificate of their prosperity yesterday in two wagonloads of high-grade ore.

GILPIN COUNTY.—Gilpin County *Observer*: The lessees on the Nottaway are drifting and stoping at a depth of about 125 feet, and have opened up a body of mill dirt nearly two feet wide at a point about 65 feet east of the shaft, together with 18 inches of smelting iron. The mill dirt averages four ounces of gold and makes 2500 pounds of tailings worth $20 a ton, and the smelting-ore sells for from $60 to $80 a ton net.

HINSDALE COUNTY.—Hinsdale *Phonograph*: There has been much discussion as to the value of a dozen sacks shipped by express to Denver recently. Mr. Yankee says that the sacks weighed 1020 pounds gross, or a net of just half a ton within two or three pounds. The value was at the rate of over $10,000 per ton, the owners of the Golden Fleece receiving $5000 odd for the half-ton, and after all expenses were deducted, including the express charges of 3½ cents per pound, it gave net returns of $2562.

BOULDER COUNTY.—Boulder *Herald*: There has been wonderful activity in mining in Boulder county during the past year; numerous sales have been made of properties that have been lying idle for many years. A new mining camp has sprung into existence, which has furnished employment to hundreds of men, and other unprospected localities are now being filled by miners digging over the mountainsides in quest of gold and silver. The Nelly Bly shaft is 40 feet deep, well timbered and producing a grade of fine gold-quartz. An assay made from the concentrates last week in Denver gave $1947 per ton, while the general character of the mineral is of good grade.

RIO GRANDE COUNTY.—Creede *Chronicle*: The daily shipments from Creede mines continue in excess of those of same dates in preceding months. Fourteen cars were in the ore-train on Thursday, carrying 224 tons. On Friday the Rio Grande ore-train from this camp consisted of 17 cars containing 272 tons of Bachelor mountain ore. The Pueblo smelters receive the greater portion of the ore sent from Creede, and the mining men and speculators can verify the *Chronicle* figures by comparison with smelter receipts. Sixteen carloads went down on the ore-train last night, a majority of the cars containing 20 tons. Five cars contained rich sulphides from the Last Chance. The Amethyst mine will ship ore enough this month to break the past monthly record of the camp, while the Last Chance and other properties will swell the amount to such an extent that the mining world will scarcely believe that it is possible, considering the infancy of the camp.

IDAHO.

MINE AND MILL.—Idaho Springs *Gazette*, Oct. 15: Notwithstanding the low price of silver, the monthly output of the mines in this camp is on the increase. The Hot-Pot mine, at the head of Virginia canyon, now being worked by Fish, Boyd & Co., is producing a very good grade of smelting ore, besides large quantities of mill dirt. Across the canyon, east from the mine is the Lake, which is worked entirely by leasers and with good paying results. Engberg & Co. milled a car of very good ore from there last week, and the other leasers have a car or more on the dump ready for shipment. East of the Lake we find the Comstock and Dove's Nest, both in good ore. The West Santa Fe, owned and worked by the Fortunatus M. Co., under the management of John Trathen, is coming rapidly to the front as a dividend-

payer. The East Santa Fe, owned by Beach, Davis & Co., is being rapidly developed, and will in a short time be one of the best mines on the hill. Near there is the C. T. Minott, a new discovery by Jim Redd, which shows good pay at surface. A recent shipment ran well in gold and silver. A surface cut has resulted in demonstrating that it is the top of a good ore chute. At the east end of the cut he has sunk a shaft 15 feet, in both ends and bottom showing a streak of smelting ore from six inches to over a foot in width and worth about $5 a sack. In the east end a solid streak of chloride delights the eye and indicates a rich body going east. The balance of the vein is mill dirt that pans well. The shaft is being timbered, preparatory to extensive work. The crevice is very soft so far. The boys take out about 15 sacks a day. The Sun and Moon, operated by Johnson & Co., is producing some nice ore, mostly gold. Drifting and stoping is in progress, the water making too rapidly for sinking with a whim. The shaft is 160 feet deep. The Cincinnati, worked under lease by Pendar & Morgan, is turning out from two to three carloads of good ore per month, furnishing employment to 18 men. Riley Bros. are working the Franklin, west of the Cincinnati, and the outlook is very encoureging. Farther to the west, across the gulch, is the famous old reliable, the Gem, which continues her usual output of 10 or 12 cars of copper ore per month. Leasers on the Gem Extension have encountered a large body of ore of similar character to that of the Gem and are shipping it with very good results. South of the Gem Extension lies the Tropic, which is now worked for all she is worth and bids fair to surpass herself in her production of the palmy days of '79–'80. Just below the Tropic is the Pine Shade, with a record for production reaching into the thousands, and is still doing the elegant in good shape. Just below is the Silver Queen, which has produced ore that milled $68,000 per ton. This mine is being worked in good shape. The handsome and commodious shaft and orehouse is an ornament to Seaton and contains all the best mine equipments, including a boiler and engine that work smoothly. Recently a large body of smelting ora and mill dirt was encountered in the breast of the lower level, 40 feet east of shaft. A large vein of water broke in at tha sama time, necessitating a suspension of drifting for the time. Stoping is now being done. A fine-looking lot of smelting ore is being cobbed. What the mine needs sadly is a stampmill on the ground to treat the mill dirt, of which there is a large body, but the most of tha value of which is now used up in transportation and mill charges. The Silver Queen is a mina of great promise.

OREGON.

RANDOLPH MINES. — Bandon *Recorder*: Dr. Haesen, an old soldier, of Nebraska, and Mr. Souloa, of Seattle, Wash., capitalists, will start work near tha old Lane black sand mine, back of Randolph, using General Buell's process of separating the gold from the sand. Experiments so far have proved tha value of the process, and preparation for work on a larger scale is being made. The company has started in to put up a building 20x40 feet, and will construct six tanks, with a capacity of 15 tons each, in which to operate upon tha sand. Fahy's mill started up this week and will cut the lumbar to ba used at the mines. If the venture proves entirely successful it will make lively times in this part of Coos.

THE LA BELLEVUE.—*East Oregonian:* Reliable information concerning the Cabell mine deal has been given this paper. The sale was arranged through Cashier Parkar of tha First National Bank of Baker City, who, togethar with D. P. Thompson, is interested with the Cabell Bros. in the property. Tha purchase was mada by an English syndicate of Butta, Montana, and the Wide West mine, owned by Lucas & Flahirty, was also bought. The deal will not be completed until patants are obtained for tha several claims comprised in thesa properties, and the syndicate has agreed to bear tha expense of patenting and to allow the present owners to continna in charge of the mines until tha titles ara perfected, when cold cash will be paid, the purchase to ba consummated within 90 days. The Wide West sold for $20,000. The consideration for the Cabell property is unknown. The mine was held at $250,000.

BAISLEY-ELKHORN.—Bedrock *Democrat*, Oct. 17: Mr. S. N. Mahan, millwright, who has finished his labors in the construction of the new mill of the Baisley-Elkhorn Mining Company, arrived in the city yesterday. Mr. Mahan informad the reporter that the mill was to be started yesterday morning. The plant, Mr. Mahan says, is one of tha finest in tha northwest and has a capacity of 65 tons per day.

HURDY GURNY M. Co.—Tha mill plant of the Hurdy Gurdy Mining Company, with property at Elkhorn mountain, was to have started up yesterday morning. Tha mill is a small one, but will be abla to do effective work, as tha ore recently uncovared in the Hurdy Gurdy is said to be extremely rich in gold.

QUARTZ CRUSHER.—Grant's Pass *Courier*, Oct. 20: Messrs. Taylor and Ezell ara making arrangements to erect a Thorn quartz crusher at a point on Williams creek convenient to Black Oak, Trio, Terminus and Ezell quartz claims. Doc Taylor went to Portland last week for tha plant, which will cost in the neighborhood of $6000. Tha crusher will be operated by water-power and will run day and night. The Thorn crusher is capabla of crushing ora as low grade as $2 to tha ton at a profit, and thera are thousands of tons of rock in sight which assays from $15 to $20. Some 25 men will be employed on the worke when tha plant is in poeition and it will be a big thing for the mining interests in that part of Josephine. Tha location of tha works is about 17 miles from this city, on Farrie gulch. A chlorination works will be erected in connection to disposa of the concantrates.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Oct. 27, 1892.

General trade the past week was interrupted by the Columbus festivities. The tenor of advices indicates an enlarging demand, hut no decided enlargement in firm orders. The spirit of conservatism, which has been the characterizing feature of trade the past year, still continues. Traveling salesmen, as a rule, state that consumers are huying more freely. If this is correct it will he only a question of time when all branches of trade will feel its revivifying effect, and in this ironworkers ought to share. The greatest drawback is claimed to he the exorhitant freights from this city to consumptive or distrihutive points on this coast. Eastern mail advices report a steadily growing demand for goods, which causes a freer movement than has been witnessed for all of three years past. The increasing trade is being heneficially felt hy all manufacturing industries.

In the local money market there is a continued good demand for funds from commercial hanks, hut from savings hanks the call is sluggish, owing to there not heing any decided movement in real estate, and also in improvements, more than usual. Remittances from the interior are only fair, but they are in excess of the demand for crop purposes. As for the latter, the call is ahout over for the season. The two holidays in next month, which will he followed hy the usual midwinter holidays, are having some effect on the market, and until they have passed it is hardly reasonahle to suppose that either finance or trade will resume their normal conditions, particularly with large sums of money to he called in for the usual dividend and interest dishursements in January. At the East, the money centers report a fairly active call for funds, hut with no friction apparent. A leading financial paper in New York says that the interior States ahsorhed and retained more money from last year's crop movements, to meet this year's requirements, than ever hefore, and in consequence there have heen less violent fluctuations in Eastern money centers; less anxiety as to the adequacy of the currency supply; less dependence on the Government, and no expedients for dishursing unusual amounts at the time when currency requirements are greatest. The Treasury, with a reduced halance, has met the needs of the season this far quite as readily as in any of the years when, with a large surplus, unusual means are employed for dishursing large amounts at the time of active currency demands.

Another important factor is at work in promoting a general ease in the money centers at the East, viz., an increasing demand ahroad for American securities. Leading New York hankers have executed several large orders, which is accepted as one of the first hright rays in the foreign situation that has been visihle for some time past. This is one of the many directions in which gradual improvement of the financial situation is to he noted.

The International Monetary Conference, which meets at Brussels on November 22d, attracts increasing attention. Prohahly the near approach of the time for convening is largely due the fact that the silver prohlem or question was early lost sight of in the present presidential election. This absence has contrihuted largely to the advantages of himetalism, for, as a leading Eastern exchange says, it would have heen most unfortunate, so far as the prospects of the approaching Monetary Conference are concerned, if the silver question had become one of active controversy in this country just now. Enough has been shown hy the declarations of the political platforms to establish the fact that this country is alive to the silver question, and that independent action will he taken if international negotiations fail. It was not to be supposed, in view of the strength shown hy the silver faction in the past, that more than this could be accomplished in advance of the meeting of the Conference. The meeting will now he held with the knowledge that a time has come for action, and that changes in the policy of great nations, and affecting the interests of all nations, are to he expected whether the Conference succeeds in reaching an agreement or not.

The usually well informed Washington correspondent of the New York *Commercial Bulletin*, writing on the monetary conference, says that Senator Jones and ex-Comptroller Cannon will leave for Europe on November 10th, and the other American delegates will leave two days later. The correspondent further says:

It seems to he settled that Mr. Edward O. Leech, the Director of the Mint, will accompany the American delegates as their statistical and financial expert. The mint directors of England, France and Germany will be at the conference as delegates, and Mr. Leech was not anxious to go in a less distinguished capacity, hut the eagerness of the President and of the Secretary of the Treasury have prevailed over his disinclination. He has had his clerks husy on the statistics of the money circulation and the coinage of the world, with the varying relations of gold and silver under different laws and in different epochs, and will he able to furnish the delegates instantly with any particular fact or figures which they desire. One or two clerks familiar with French and other foreign languages will prohahly he sent along from the State Department to assist the American delegates in keeping their records and preparing papers. As the conference comes nearer, and the attitude of the hanking community of Europe hecomes hetter understood, illusions are heing dissipated, and the conviction is growing that the chances are none too hrilliant of substantial results. The question is very likely to arise early in the proceedings, what the United States is willing to concede to the great European powers if they will open their mints to silver or adopt measures for its wider use. Our delegates may he hrought face to face at an early date in the gathering with a proposition to make some hig tariff concessions hy way of reciprocity for the opening of European mints. The articles on which concessions are most likely to be asked, if they are asked at all, are manufactures of cotton, wool and silk. It will be a prohlem hig with significance for the future of our politics, as well as our finances, if a majority of our five delegates send word to the President and Cahinet that the larger use of silver hy the nations of the world can he ohtained hy liheral tariff concessions. It is idle to speculate how such a proposition would he received when it has as yet heen only hinted at, and its reception may vary according to the result of the National election. It is not heyond possihility that Senator Allison, of Iowa, would join the two Democratic delegates, Professor Andrews and Governor McCreary, in favoring a reciprocal arrangement of this sort, even if Mr. Cannon and Senator Jones were opposed to it.

SILVER—The market has held strong, with slight fluctuations, throughout the past week. The markets at home and also ahroad act very much as if the manipulators of silver have no regular defined policy and will not have any until the Monetary Conference meets, and a general idea is had regarding the prohable result. The heavy purchases hy the United States, and an increasing demand from silver-using countries, are strengthening the markets irrespective of what action will he taken hy the conference. The last steamship for China took out $85,000 in hullion for Japan.

MEXICAN DOLLARS—Exports by sea the past week aggregate as follows: To China, $656,507. The market has hung around 68¼ cts.

QUICKSILVER—Receipts the past week aggregate 666 flasks. The market is stronger in sympathy with an improvement ahroad.

ANTIMONY—The market is steadier, in sympathy with New York, which is reported to he hardening under a concentration of stocks.

LIME—Receipts the past week aggregate 4232 hhls. The market is essentially unchanged.

BORAX—Receipts the past week aggregate 740 ctls. and exports hy sea 3080 ctls. to New York. This shipment went hy P. M. S. S. Co. via Panama, which indicates lower freights.

PIG LEAD—The market is slow and in huyers' favor. New York mail advices report that consumers are standing for low prices, in view of the fact that the production is in excess of the demand.

PIG IRON—The market is virtually unrhanged, hut in view of decreasing stocks in England and improving markets at the East. The New York *Iron Age*, Oct. 20th, says: "It is hecoming more and more evident that current consumption is enormous, greater hy far than even the sanguine expected. The low prices so long prevailing are evidently aiding iron and steel to enter into many channels. The one conspicuous exception is the rail trade, which is langkishing, so far as orders are concerned. Reports from the leading primary pig-iron markets are decidedly encouraging. While occasionally low prices do crop up, it is unquestionably true that sellers are in a hetter position than they have heen at any time this year, and it is not impossihle that the modest advance of 25c on foundry and forge grades may he secured at an early date."

TIN—Trade is quiet, hut the market is quoted fairly steady. New York advices report that a hull campaign appears to he shaping itself under the "old dealer" and his assistants. London cahles report as follows: "Operations in pig tin have continued on a quite liheral scale, and under the influence of good purchases for America and the continent. Business in tin plate has heen quiet and the Swansea market is easier. Business at the quarterly meeting was meager, prices offered not meeting makers' views. Uncertainty regarding the Presidential election in America also retards husiness."

COPPER—The market has strengthened, owing to the decision to close down the Anaconda mine on November 10th for a period of three months. The mine is the greatest producer in the world, having a record of having made over 12,000,000 lhs. in a single month. Mail advices from New York state that the statement is also going the rounds that the leading lake companies will ship no copper after the close of navigation except on orders, and that consumers who do not place orders in advance may he inconvenienced. Back of this come intimations that deals are working in the market for copper-mine shares, and that more or less maneuvering is going on with a view to helping operations in that line. In other words, there is a broad insinuation of stock-jobbing, in which some handlers of the metal are deeply interested.

COAL—Imports the past week aggregate as follows: Nanaimo, 3153 tons; Departure Bay, 7699; Tacoma, 8300; Cardiff, 5984; Seattle, 680; Newcastle, N. S. W., 3700; Liverpool, 2300; Swansea, 1765; Coos Bay, 500. Total, 34,077 tons. The market has held steady throughout the week. Heavy imports the past two weeks have not had any visihle effect on the market, owing to the foreign having heen cared for. High outward freights at Australia and English ports are against forward shipments except at an advance, while the tonnage on the way is lessening.

Eastern Metal Markets.

NEW YORK, Oct. 26.—The following ara tha closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday.....	39 5-16	85¼	11 65	3 90	20 70
Friday.....	39 7-16	.....	.....	.....	.....
Saturday.....	39 7-16	86	11 65	3 93	20 70
Monday.....	39 7-16	86¼	11 65	3 80	20 60
Tuesday.....	39 5-16	85¼	11 75	3 80	20 60
Wednesday....	39½	85¾	11 75	3 80	20 55

For copper 12c is quite generally asked. There is every indication that prices will be better. It is certain that prominent producers are prophesying 12½c for lake brands after November 1st. Pig iron is active Lead is weak. Pig tin is under manipulation. Quicksilver shows a slight gain, in sympathy with a better London rating; New York quotes 53½@54o.

Mining Share Market.

SAN FRANCISCO, Oct. 27, 1892.

The market has heen fairly active the past week in the Comstocks, hut dull and heavy in the outsiders. Belcher was the leader in the former—and the lively fluctuations were reminders of the gamhling days long gone hy. The fluctuations in Belcher ranged around 20 per cent, which gave turn-takers rare opportunities of making money, hut at the same time, these very fluctuations made dealing hazardous, particularly when huying on margin.

As yet the public has not taken kindly to the game; this is shown hy the small attendance in the two hoards, and also at the various "tickers." As a rule, very few, if any, persons of means, or, as for that, of limited means are to he seen watching the moves, for experience has taught them to let severely alone other persons' games where it is "head the insider wins and tails the outsider loses." It is a great game, this; and only a master hand at concocting the most harefaced swindling prospectus could have conceived it. The mines are, it is said hy experienced miners, worked almost entirely, if not altogether, to correspond to the game run on Pine street, and not, as they should he, in the interest of shareholders. At times even the mill rings are fooled hy the work in the mines, for often ore is struck hefore desired or else it takes longer to run for it than had heen estimated, either of which interferes, temporarily of course, with their projects; hut this obstacle has heen or is heing corrected hy having miners at important points who know nothing, or in other words, who give only that away which the rings wish to have known. Is it to he wondered at that dealing in mining shares has lost caste with persons having any regard for their social and financial standing? The fact that it is hullion for insiders and assessments for outsiders was hut well estahlished hy the suit of M. W. Fox against the late directors of the Hale & Norcross Mining Company; and it is this knowledge on the outside which makes it the more difficult to draw gudgeons into the net.

Why do not the mill rings have the mines worked and the ore milled to conform to the law under which the companies incorporated, so that *all* hullion will he turned over to the companies? The way in which the business has heen conducted has not only killed the mining share market, hut has nearly ruined the mining industry of the coast.

In justice to the new hoard of directors of the Savage Co. and to all others in interest, the writer will state that H. Zadig says he has not heen a director in the company for about nine months. This carries it hack to the time when H. M. Levy, of the Hale & Norcross notoriety, was president of the Savage Co., and who, it is said, was compelled to resign from the latter company.

About one week hefore the mining share market reached the highest figures in last month, the Virginia *Enterprise* came out in a full report on the work in several of the mines, from which we excerpt the following: "The management (Belcher) is now running a west crosscut on the 400 level with the hope of tapping an extension of ore from the 300 level. There is a chance for an ore-hody in the neighborhood toward which the crosscut is heing pushed, and a development of importance may he made there in the near future. In the Crown Point a 3-foot streak of fair-milling ore is heing followed south on the 3d floor of the 160-level stopes. Besides this, some ore is heing found in places on the 230 level and saved. These are small profits, perhaps, and do not figure much in the stock market or the expenses of the mine, hut they are a showing and may expand into something of more magnitude at any time. There is hoth fair-grade ore and low-grade quartz in sight at the Justice. There is a vein of $25 ore three feet wide in the stopes on the 820 level, 50 feet up from the track floor. The low-grade quartz is in the top of the raise from the south winze from the 620 level. This quartz may run into something hetter in the course of future work. In the Kentuck a pay streak in the north drift from the east crosscut on the 160 level is heing developed. The extent of this streak will he hetter known as developed. The scale of operations at the Yellow Jacket is slowly enlarging, and the working of the mine on the same hasis as hefore the recent draft, will soon he resumed. This only awaits the raising of the Carson river. Preparations for pumping in the joint Belcher and Crown Point incline are coming to a focus, and a more decided movement in that quarter will soon be in order. The sinking pump there will he started as soon as the compressed air and water-pipe fittings are ready, which work will he completed presently. A greater interest will he manifested in Crown Point operations as soon as the water has heen dropped to the lower levels. Deep-mining there may do something for the lode. Who can tell? Developments of importance on the 1800 level of the Hale & Norcross, in the same neighborhood in the Con. Virginia and on the 2000 of the Crown Point would revive the Comstock in a way that would make the oldtimers think the palmy days were returning."

It seems needless to say that after the market had heen to the highest figures, the above information was forgotten and, instead, the papers harped about water, porphyry, etc.; hut now that the rings have squeezed all the shares out of the public that it has heen possihle to do, and an upmove is in contemplation to again play the old game, it is quite likely that the above information will he again hrought out and perhaps enlarged to suit the purposes of the rings, so as to catch gudgeons.

Yesterday, Mr. Hughes, a well-known mining-share operator, offered to give a dealer 500 shares in any mine controlled hy Bob Morrow, if he, the dealer, would pay him, Mr. Hughes, the assessments that would he levied hy the company for one year—and Mr. Morrow is the reported hroker for D. O. Mills.

Seemingly reliable advices from the Comstock mines report that on the 1800-foot Ward shaft level connection will soon be made with Potosi. This is quite important, for it will give excellent ventilation and admit of successfully developing the west lode at that depth. The Sierra Nevada drift has heen turned south so as to intercept at that depth the ore found to the west in Iowa Hill. In Belcher they are still pushing the north lateral drift on the 400-foot level. On this level they are running a west crosscut about 80 feet from point of starting the drift. When they strike the west lode work will prohahly

be stopped, and the crosscut, as has been the case before, be declared a failure, provided they are not ready to sell shares. They are milling ore from the Yellow Jacket, Challenge and Con. Imperial. In Belcher they are sinking on the 300-foot level. News from other mines is of an important character, but this will probably be more than offset by assessments in the near future.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13½	English, lb.....	— @ 18
BORAX.		Canton tool.....	— @ 8½
Refined, in car lots	— @ 7½	3i'k Diam'd tool	8½@ 15
Powdered, do...	— @ 7½	Pick & Hammer.	9 @ 10
Concentrat'd, do	— @ 8½	Machinery.....	4 @ 5
All grades jobbing at advance.		Foe Calk.....	@ 4½
COPPER.		**TINPLATE**	
Bolt	22 @ —	B. V. steel grade	
Sheathing.....	22 @ —	14x20, spot.....	— @ 5 87½
Ingot, jobbing..	— @ 14½	Charcoal, 14x20.	— @ 5 87½
Do, wholesale..	— @ 13½	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28....	@11 75
IRON.		**TIN.**	
Bar, base.....	— @ 3	Spot ₱ lb.....	— @ 23
Norway, base...	— @ 4½	**COAL.**	
PIG IRON.		**SPOT FROM YARD—PER TON.**	
	Spot.	Wellington.....	$8 00
Eglinton ₱ ton	22 00@ —	Greta.....	7 50
Glengarnock....	23 00@ —	Nanaimo	6 50
Am. Soft, No. 1	24 00@ —	Gilman.....	6 00
Oregon Pig.....	— @ —	Seattle.....	6 00
Puget Sound....	— @ —	Coos Bay	5 50
Clay Lane White.	24 00@ —	Cannel.....	8 50
Langloan	23 00@ —	Egg bard.....	12 00
Thorncliffe.....	23 00@ —	Cumberland, in sacks...	15 50
Carterherrie.....	22 00@ —	Do, bulk	14 00
Barrow.....	22 00@ —	Wallsend.....	7 25
Cargoffeet.....	22 00@ —	Scotch Splint.....	7 50
CHROME IRON ORE.		Brymbo	7 50
Per ton.....	10 00 @ —	West Hartley.....	7 50
LEAD.		**TO LOAD—PER TON.**	
Pig.....	— @ 4½	Australian.....	5 00@ —
Bar.....	— @ 5½	Liverpool Steam	6 25@ —
Sheet.....	— @ 7	Scotch Splio'...	6 25@ —
Pipe.....	— @ 6½	Cardiff.....	6 50@ —
SHOT.		Lehigh Lump.....	15 00@ —
Drop, sizes *smaller* than		Cumberland.....	13 00@ —
B, ₱ bag of 25 lbs.....	$1 85	Egg. bard.....	11 00@ —
Do do, B and *larger* sizes ₱ bag of 25 lbs	2 10	West Hartley.....	7 00@ —
Buck, Balls and Chilled		**COKE.**	
do, ₱ bag of 25 lbs.....	2 10	English, to load..	$8 00@ 9 00
QUICKSILVER.		Do, spot, in bulk..	— @10 00
Home trade, pr. flask.....	41 50 @42 00	Do, in sacks.....	— @12 00
For export.....	35 50 @36 00	Cumberland.....	9 00@ —

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 18, 1892.

484,726 —RANGE-FINDER—C. M. Allen, S. F.

484,513.—WHEAL CULTIVATOR—D. E. Barton, S. F.

484,727.—GAS ENGINE—Dau'l Best, San Leandro, Cal.

484,728.—GAS-ENGINE MOTOR — Dan'l Best, San Leandro, Cal.

484,729.—LUBRICATOR—Dan'l Best, San Leandro, Cal.

484 732.—DOMPING-WAOON—L. Busse, S. F.

484,408.—CONNECTING-PIPES—A. Clancy, San Diego, Cal.

484,656.—COUPLING—I. P. Doolittle, Redlands, Cal.

484,706.—TRAMWAY SWITOH—J. H. Gagle, Seattle. Wash.

484,552.—ELASTIC CUSHION FOR HUBS—J. R. Gleeson, Chico, Cal.

484,735.—BITUMINOUS-ROCK MACHINE—Hall & Wood, Oakland, Cal.

484,424.—RAILWAY RAIL JOINT—G. W. Hanner, Holbrook, A. T.

484,739.—HARROW—T. J. Hubbell, San Bernardino, Cal.

484,741.—TILE—R. E. Hunn, Vallejo, Cal.

484,505.—MILKING-MACHINE—J. C. McCollum, Los Angeles, Cal.

484,459.—STRAINER—Mary B. Reynolds, Tacoma, Wash.

484,724.—ELECTAIC MOTOR—A. W. Smith, S. F.

484,473.—RIVETING-MACHINE—F. H. Steelow, Los Angeles, Cal.

484,748.—COPYING-PRESS—E. F. Verrill. S. F.

484,478.—FLOUR-REAL MACHINE—J. A. Wahlstrom, Salem, Or.

21,902.—DESIGN FOR CUFF-BUTTON—J. A. Bidwell, Pomona, Cal.

21 906.—DESION FOR ELECTRIC-DYNAMO FRAME, G. B. Fraley, S. F.

The following brief list by telegraph, for Oct. 26, will appear more complete on receipt of mail advices:

WASHINGTON, October 25th.—Pacific Coast patents issued to-day: John H. Bates, Santa Barbara, washing machine; John Burns, Los Angeles, fruit-cutting machine; Arnold Kempe, Oakland, bicycle; John H. Kruz and M. K Shipley, Oswego, Oregon, feeder for baling-presses; Winfield S. Miller, Milpitas, Cal., cultivator; Austin A. Pratt, Independence, Oregon, potato-digger; Emery E. Smith, Palo Alto, label-holder; H. P. Bennett, Phœnix, A. T., excavator; A J. Taylor, Silver City, Nev., grinding pan.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AOXILIARY VALVE FOR ELEVATORS.—Alexander J. McAdam, San Francisco. No. 484,223. Dated Oct. 11, 1892. This invention relates to a novel auxiliary valve for elevators and the mechanism for operating it. The object is to provide simple and effective means for operating the main valve from the cage or car.

DOMPING WAOON.—Leopold Busse, S. F. No. 484.732. Dated Oct. 18, 1892. This is one of that class of dumping-wagons in which the bottom-boards are hinged to the lower edges of the sides, whereby said boards move to and fro from the center to close and open the bottom. The invention consists in the novel arrangement and construction of the support for holding the bottom-boards and relieving them and in the connections by which said supports are operated.

DESIGN FOR AN ENGINE FEAME.—Daniel Best, San Leandro. No. 21,887. Dated Oct. 11, 1892. The leading feature of this design is the peculiar outline of the frame in which the two opposing cylinders are fixed, the frame having a peculiar, irregular, trough-shape from the ends to the center, and having the two ends out of line with each other in a vertical plane.

FASTENER FOR THE MEETING-RAILS OF SASHES. James C. Plunkett, Oakland. No. 484 235. Dated Oct. 11, 1892. The invention relates to certain improvements in devices for locking and securing window-sashes with relation to each other. It consists of two plates—one fixed to the upper and the other to the lower sash. One of these plates has a bar hinged to it so that it may be raised into a vertical position or turned down into a horizontal position, and it has a swivel link connected with it which is adapted to hook over a lug upon the opposite plate when the bar is raised up, and to lock with the lug when it is thrown down. A spring latch holds the bar in this position and prevents its being raised from the outside. When it is desired to partially open a window and lock it, a plate is fixed to the top of the lower sash near one end, having two bars hinged to it so as to fold down across each other. Slotted plates are fixed to the vertical side of the upper sash and to the window-casing, having lugs at intervals, to either of which the links on the bars may be locked and the sashes thus retained at any point, when open, as securely as when entirely closed.

CONTINUOUS KILN.—Wm. Radford, San Jose, No. 484,237. Dated Oct. 11, 1892. The object of this invention is to make certain improvements in that class of kilns comprising a series of successive adjacent chambers into which the wares to be burned are placed. It consists in a means of more effectively applying the heat to various parts of the burning-chambers when in operation and a means for transferring a portion of the heat from the completed wares to chambers containing unburned wares, whereby greater economy of fuel and effectiveness of work are produced.

WOODEN LIQUID-CONTAINING VESSEL.—James M. Schofield, Merced, assignor of one-half to F. S. O'Brien. No. 484,249. Dated Oct. 11, 1892. This is one of that class of vessels made of separate section pieces or staves of wood and designed to hold liquids, such vessels, for example, as casks, barrels, kegs, tanks, etc. The invention consists in seating in the joints of such vessels pieces or strips of absorbent material, and its object is by keeping said material wet to introduce and maintain moisture in the joints to swell them and keep them tight, thus avoiding leakage by shrinkage.

CULTIVATOR AND PULVERIZER. — C. C. Reynolds, Kelseyville, Lake county, assignor of one-half to J. C. Plunkett, Oakland. No. 484,239. Dated Oct. 11, 1892. This apparatus consists of cultivator-teeth adjustably mounted and supported from a traveling sulky frame, and in conjunction therewith, of an adjustable crushing roller peculiarly constructed. The roller is preferably made with elastic plates, hinged to it in such a manner that these plates serve as crushers or rubbers when they pass over the cultivator-teeth by the rotation of the roller. The advantage of hinging these plates and making them elastic is specially seen where there are rocks or substances which cannot be crushed, and if these pass between any one of the elastic plates and the cultivator, that plate will yield sufficiently to leave space for the rock to pass, while the remainder of the plates, encountering only the material which can be crushed, will continue to act upon the material and crush it without reference to the size of the stone which may be passing under the other plate. Without the use of these elastic plates the whole roller would be lifted by such a rock and any clods that might be passing through other parts of the roller at such a time would escape without being crushed.

LUBRICATOR.—Daniel Best, San Leandro. No. 484,729. Dated Oct. 18, 1892. This is a novel device which is especially applicable for lubricating the movable parts of steam and gas engines, and for other apparatus in which the action of the lubricator is regulated by the movement of the machinery itself. The patent covers certain details of construction.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

OREGON BITOMINOUS ROCK COMPANY. Capital stock, $500,000. Directors—John Bays, Ferdinand Smith, Martin Weston, Elias Groat and John W. Nye.

THE BANK OF SAN LUIS ORISPO (San Luis Ohispo). Capital stock, $300,000. Directors—J. P. Andrews, R. E. Jack, William L. Beebe, W. H. Spencer and Nathan Goldtree.

CENTRAL CALIFORNIA CONSOLIDATED LAND AND WATER COMPANY. Capital stock, $1,000,000. Directors—Eugene J. Gregory, J. C. Sala, G. W. Lnce, J. Berton and A. B. Summers.

SAN LUIS ORISPO COUNTY NURSERY COMPANY (Paso Robles, San Luis Obispo County). Capital stock, $60,000. Directors—R. C. Stubblefield, L. C. Rice, C. A. Runnels, R. Butcher and H. C. Fry.

THE DUNCAN GOLD CURE COMPANY (Oakland). Capital stock, $25,000. Directors, J. G. Hoyt, E. S. Finch, W. H. Stinger, C. F. Baker and B. S. Power.

Complimentary Samples.

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ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Brunswick Cons C M Co, California	4	2c	Sept 29,	Oct 31, Nov 17	J Stadfeld Jr, 309 Monigomery
Bullion M Co., Nevada	4	25c	Oct 20,	Nov 24, Dec 14	R R Grayson, 331 Pine
Carra M & M Co			Sept 28,	Nov 18, Dec 28	C C Coleman, 16 Fremon
Commonwealth Cons M Co, Nevada	9	10c	Sept 7,	Oct 13, Nov 9	R R Grayson, 336 Pine
Cons Pacific M Co, California	14	10c	Sept 29,	Nov 5, Nov 30	F E Luty, 330 Pine
Cons St. Gothard M Co, California	6	5c	Oct 13,	Nov 17, Dec 7	T Wetzel, 320 Sansome
Crown Point M Co, Nevada	58	25c	Sept 15,	Oct 20 Nov 10	J Newlands, 331 Pine
Derbec Blue Gravel Co, California	10	10c	Sept 14,	Oct 17, Nov 7	T Wetzel 320 Sansome
Eureka C ns Drift M Co, California	5	0c	Sept 19,	Oct 24, N v 14	D M Kent, 330 Pine
Ev ning Star M Co, California	6	2c	Oct 10,	Nov 1?, Nov 29	J Scoville, 320 Sansome
Golden Fleece Gravel M Co, Calif rnia	'S	83	Oct 10,	Nov 16, Dec 7	W J Gleason, Phelan Block
Gray Eagle M Co, California	30	6c	Sept 28,	Oct 31, Nov. 21	A W Barrows, 363 California
Inyo Marble Co, California	18	50c	Sept 2,	Oct 22, Dec 1	A F Thane, 137 Montgomery
Jack Rabbit M Co. Nevada	1	5c	Sept 17	Oct 19, Nov 3	T Wetzel, 320 Sansome
Justice M Co, Nevada	51	1'0	Oct 14,	Nov 18, Dec 8	R E Kelley, 419 California
Kentu k Cons M Co, Nevada	5	10c	Oct 3,	Nov 8, Nov 29	J W Pew, 310 Pine
Mexican M Co, Nevada	46	25o	Oct 13,	Nov 17, Dec 7	C E Elliott, 309 Montgomery
Mono M Co, California	32	25c	Sept 15,	Oct 24, Nov 14	H D Walker, 309 Montgomery
North Belle Isle M Co, Nevada	20	10c	Sept 1,	Oct 6, Nov 7	J W Pew, 310 Pine
Occidental Cons M Co, Nevada	11	2?c	Oct 25,	Nov 30, Dec 21	A K Durbrow, 309 Montgomery
Overman M Co, Nevada	65	3?c	Oct 5,	Nov 10, Nov ?0	C D Edwards, 414 California
Savage M Co, Nevada	79	?0c	Oct 7,	Nov 9, Nov 29	E B Holmes, 309 Montgomery
Silver King M Co, Arizona	9	2?c	Aug 26,	Oct 7, Nov 4	J W Pew, 310 Pine
White Mountains M Co, California	2	1c	Oct 13,	Nov 22, Dec 12	S K Nichols, 330 Sansome
Yellow Jacket M Co, Nevada	52	25c	Sept 5,	Oct 7, Nov 11	W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Hollingswood M Co	Special	F E Luty, 330 Pine	Oct 31

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	5	L Osborne, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 325 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clouah, 230 Montgomery	Oct 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 28

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct 5.		WEEK ENDING Oct. 12.		WEEK ENDING Oct 18.		WEEK ENDING Oct. 25.	
Alpha	.30	.40	.35	.50	.30	.50	.25	....
Alta	.30	.50	.35	.60	.30	.40	.25	.30
Andes	.55	.75	.70	.80	.50	.70	.40	.55
Belcher	2.95	4.50	3.10	4.25	3.10	3.95	2.40	2.85
Belle Isle	.15	....	*.15	....	.10	....	.10	....
Best & Belcher	2.00	2.90	2.25	2.45	1.75	2.25	1.25	1.85
Bullion	.60	.75	.50	1.05	.70	.90	.50	.70
Bodie Con	.25	.40	.30	.35	.30	.40	.25	.30
Bulwer	.35	....	.30	....	....	....	.30	....
Commonwealth	.05	....	.05	....	....	....	....	....
Con. Va. & Cal	3.60	4.50	4.00	4.45	3.45	4.65	2.75	3.25
Challenge	.80	1.05	.90	1.15	.80	1.15	.50	.75
Chollar	.80	1.40	.95	1 30	.50	1 10	.60	.95
Confidence	1.85	2.50	2.15	3.00	2.00	2.60	1.90	1.95
Con. Imperial	.05	.10	.05	....	.05	....	.05	....
Caledonia	.20	.30	.25	.30	.25	.20	.20	.25
Crown Point	1.05	1.65	1.15	1.50	1.15	*1.40	1.15	1.40
Crocker	....	....	....	....	.10	....	....	....
Del Monte	.05	....	....	....	.05	.10	....	....
Eureka Con	2.00	....	....	....	....	....	....	....
Exchequer	.20	.30	.30	.40	.20	.30	.15	.20
Grand Prize	....	....	....	....	.10	....	....	....
Gould & Curry	1.15	2.00	1.35	1.55	1.15	1.40	.80	1.15
Hale & Norcross	2.15	3.50	2.05	2.30	1.50	2.10	1.40	1.70
Julia	.10	.15	....	....	....	....	....	....
Justice	.20	.35	.25	.30	.10	.25	.10	.15
Kentuck	.15	.30	.20	.30	.15	.25	.10	.15
Lady Wash	.10	.15	.10	.15	.10	.15	.10	....
Mono	.15	....	.10	.15	.10	*.30	.25	.30
Mexican	1.80	2.40	1.85	2.10	1.50	1.85	1.15	1.40
Navajo	.15	....	....	....	....	....	.15	....
North Belle Isle	.05	....	....	....	.10	....	....	....
New Queen	.10	.15	.10	....	.10	....	....	....
Occidental	.30	....	.30	.35	.25	.30	.15	.20
Opbir	2.75	3.40	3.00	3.30	2.65	3.10	2.15	2.75
Overman	.70	1.15	.70	1.00	.55	.80	.45	.60
Potosi	.80	1.45	.95	1.45	1.00	1.20	.85	1.30
Peerless	.05	.10	.10	....	.10	.15	....	....
Pert	....	.20	....	....	.30	....	....	....
Savage	1.50	2.50	1.30	1.75	1.00	1.30	.75	1.00
S. B. & M	.55	.80	.55	.75	.50	.65	.35	.50
Sierra Nevada	1.90	2.50	2.00	2.30	1.60	2.05	1.25	1.50
Silver Hill	.20	.25	.20	.25	.15	.20	.10	.15
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.25	1.85	1.55	1.70	1.25	1.55	1.10	1.30
Utah	.30	.45	.30	.35	.20	.30	.15	.20
Yellow Jacket	.80	1.35	*1.10	1.60	1.30	1.60	1.10	1.35

*Assessment added.

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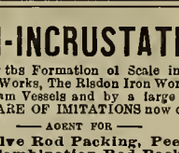

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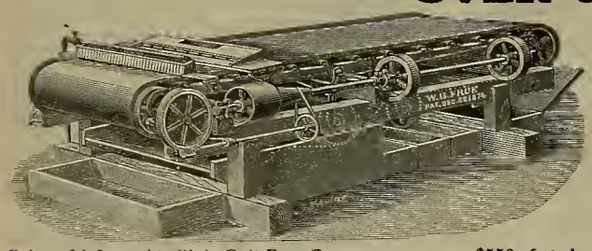

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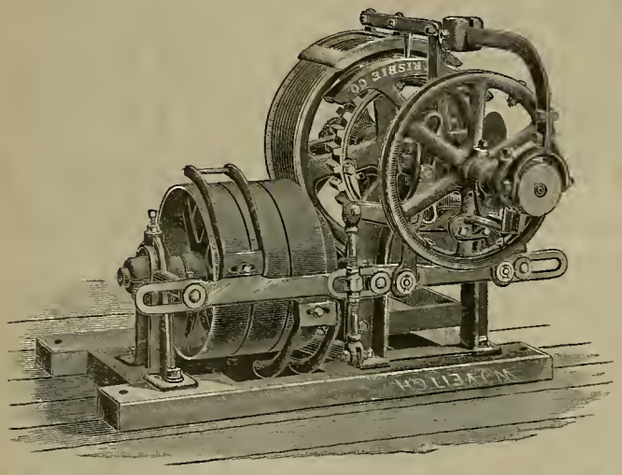

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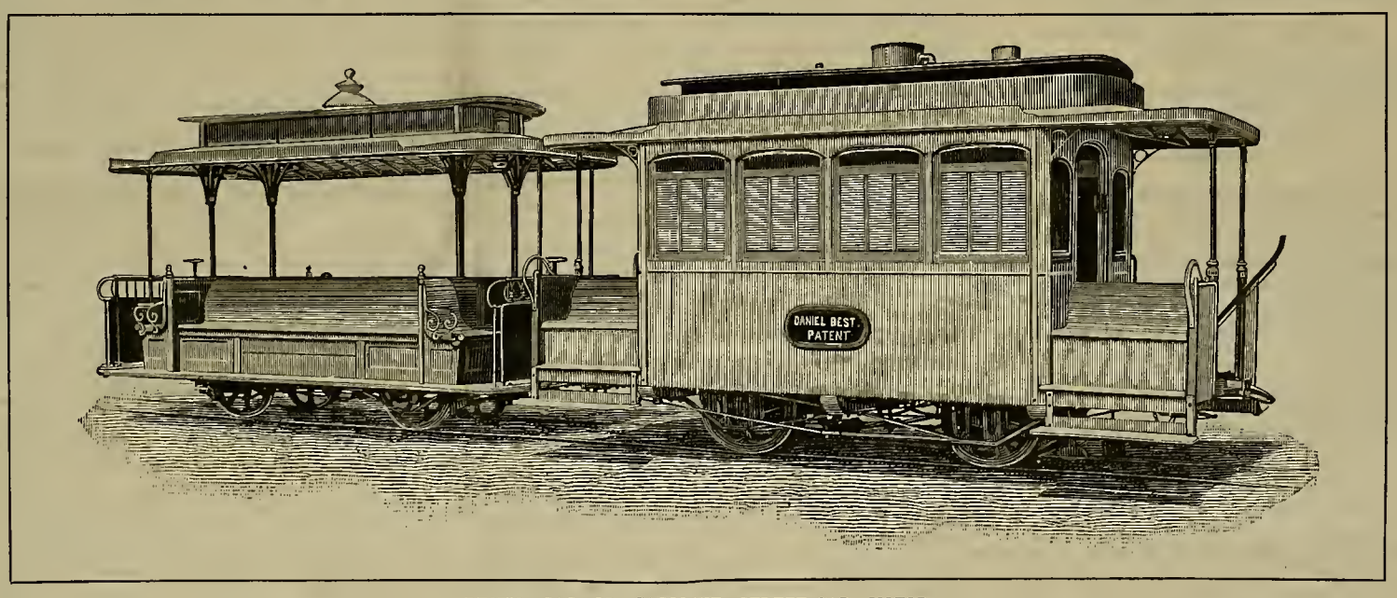
Gas or Gasoline Engines for Road Motors.

The increase of homes adjacent to cities has set inventive genius to work on the problem of safe and cheap motive power to propel cars on railway lines which extend in a radius of from five to ten miles around our cities and towns. A convenient and cheap motor is the gas vapor or gasoline engine. A practical application of this form of motive power to street car lines has been made by Mr. Daniel Best, of San Leandro, Alameda county. Some time in last January a railway line was projected from the terminus of the electric car line at San Jose to run out to Alum Rock Park, eight miles from San Jose, at the foot of Mt. Hamilton. This line has been completed for four miles and is now being built the entire distance. The Best gasoline engine is the motive power for conveying passenger and construction cars over this line.



BEST'S GAS OR GASOLINE STREET-CAR MOTOR.

The Best vapor engine as applied on this line is a double-ender, the piston of each cylinder being connected with the main shaft. Each connects direct with the forward car axle by an endless chain. The number of revolutions per minute are 200 of the engine, and of the wheels of the car 100 per minute. The wheels are 30 inches in diameter; this gives a speed of 12 miles per hour. The speed of the engine can be varied at the will of the operator from 75 to 250 revolutions per minute. The engine is geared to the axle of the car direct from the crank-shaft, and at one side there is an intermediate gear which drives one set of wheels in the opposite direction from the crank-shaft. There is but one pair of wheels working at a time; one pair run one way and the other the opposite way.

The cost of operation is stated to be as follows: 9 gallons gasoline, at 14 cents per gallon, $1.26; 1 quart lubricating oil, at 10 cents, 10 cents; total, $1.36 per day.

The gas is all consumed and consequently there is no need of using any disinfectant, as there is no offensive smell whatever.

Mr. G. W. Dolly, the present engineer, who has been continuously in charge for the last three months, says: "We usually run eight miles an hour and from 10 to 14 hours per day, part of the time being consumed in hauling out the construction train loaded with gravel. In a cut on quite a sharp hill toward the mountain the up grade is four per cent; consequently, on the down grade, as you see, I throw off the current and move along at any speed I wish by natural gravitation."

There is no noise caused by the explosion of the gas that can be heard on the rear car, and the rumbling of car wheels is all of the noise that can be distinguished outside of the car containing the motor. The motor runs smoothly, without jerk or jar, and there is no inconvenience to passengers from smoke or disagreeable smell. On Sundays and holidays two passenger cars are attached to the motor car and from 70 to 100 passengers are carried at one load. The brakes are so constructed that the car can be stopped under full motion within five feet. The size of the car is 7x11 feet. Other suburban railway lines have been projected, but it seems that the problem of cheap transportation in this field has been settled by the improved Best gas or gasoline engine or motor. The cut shown on this page is made from a photograph recently taken and is an exact copy of the motor car and passenger car as it appears at the end of the line. We shall watch with interest the progress made in this new line of industry and from time to time shall note the progress, improvements and success attending the new feature in suburban railway lines.

At the Peacock mine, in the Mogollons, N. M., in pumping the mine out, the lessees were agreeably surprised when they started up, for the old pump in the mine which had been submerged for four years started pumping without any bother. Another pump had been procured and put in place; but the old one, although drowned, was unlike McGinty, for it had its working clothes on.

The Comstock Pumping Association has levied another assessment aggregating $25,000 upon the Gold Hill mining companies which comprise it, apportioned in amounts ranging from $1250 to $3750 per company. This is the seventeenth assessment since pumping operations began, and the amount of the assessments levied is $425,000.

The annual assemblage of the miners of the Southwest will take place in El Paso, N. M., on December 5th. It will be practically a silver convention.

Grinding-Pan for Ore.

Albert J. Taylor, of Silver City, Lyon Co., Nev., has obtained a patent through the Mining and Scientific Press Patent Agency for a grinding-pan for ores which has some new features in the arrangement of the grinding-rollers. A ring-die extends around the inner periphery of the inclined sides of the pan and against these and upon the bottom dies the crushing and grinding takes place. Heretofore, it has been customary to employ a series of rollers set within the pan so that their peripheries roll against the side-die; but the irregularity of the pressure and the amount of material which comes between the dies and rollers is such that after a short use the dye will be worn into wavy surfaces, the irregularity of which is such that, if the pan is run at any reasonable degree of speed, it will throw the rollers entirely out of place, and the pans become practically useless so soon that this style has been altogether abandoned.

In this invention Mr. Taylor employs one or more horizontal rollers lying on the side of the bottom-die and having their ends adapted to travel against the side-die. These rollers are placed at intervals between the vertical rollers or bowls which stand with the ends upon the bottom-die, and the sides rolling against the side-die. The horizontal rollers placed in this manner, cause a rubbing friction between their ends and the side-die, and thus keep it worn smooth and level. Efficient grinding takes place between the ends of these rollers and the side-die, while the vertical rollers or bowls grind upon the bottom-die. By thus preventing the circular side-die from becoming irregular, the grinding is carried on as perfectly at all times, Mr. Taylor says, as when the die is new, and the dies may be entirely worn out without ever becoming irregular. In order to preserve the muller-shoes and keep them perfectly in place, the shoes are made in long sections with two or more fastening-lugs to each section. These sections are slotted to form channels through which the pulp works to the outside of the pan. Mr. Taylor is confident that this construction is better than making the shoes in short independent sections with a single fastening lug, which does not hold them sufficiently well in place.

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San Francisco, November 5, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Dividend Notice—Pacific Coast Borax Co.
Model Maker—C. W. Moulthrop.
Technical Books—Henry Carey Baird & Co., Philrdelphia.
☞ *See Advertising Columns.*

Comment.

The bulk of the quicksilver product of this State now comes from north of San Francisco, instead of from south; the cessation of work at the New Almaden mine in Santa Clara county, having caused the change. For about 40 years this famous mine continued to furnish the largest proportion of the product of the United States, but the grade of ore of late years has run very low so that there was little or no profit. The mines in Napa, Sonoma and Lake counties have received more attention since the practical abandonment of work at New Almaden. Those in Trinity and Siskiyou counties and in southern Oregon are also being opened and developed and reduction works are being erected. Napa, Sonoma and Lake counties have always been large producers of quicksilver but there are many prospects in those counties which have not yet been proved mines. Ten or fifteen years ago, when quicksilver ranged very high in price, a great number of small mines were worked at a profit, but when the price fell they were closed as they could not compete with the large producers. There has been very little change in price of this product for many years, but there have been changes in other conditions. Much less quicksilver is wasted in milling operations than was formerly the case and there is proportionately less demand. This State, the only quicksilver producer in the Union, except Oregon, yields more than is consumed in the mining operations of the country, and quantities are shipped to China and elsewhere; still, there should be room for many small mines to resume operations in California, since the methods of beneficiating the ores are better understood, simplified and less expensive than in former years. The cinnabar-belt in this State is quite extensive and, while more or less prospecting has been done, careful research may result in the discovery of more important deposits. Colusa, Mendocino, Trinity, Humboldt, Siskiyou and Del Norte counties, above Napa, Sonoma and Lake, and, below the known deposits in Oregon, are all likely localities for the prospector for quicksilver. There are still opportunities in the coast range for prospectors, for, while a good deal of this work has been done in these regions, it has been done largely by men who were not practcal miners or prospectors.

For a great mine with a great record, Con. California and Virginia makes a very poor showing for its past year's work. A large quantity of ore was worked, which averaged by pulp assay $23.37 per ton; yet it did not pay. Though the company had an increase for the year of $1,084,258.40, it came out $109,000 behind. Its greatest expense was for milling the ore, for which $323,388 were paid, at $5 per ton on the 54,898 tons worked. The published pulp assays averaged $23.37, or a total of $1,282,767; yet the mills only returned $987,624, keeping in the tailings $295,143. With what they were paid, and what they thus kept, they got upward of $670,000 out of $1,282,767 worth of ore, or over one-half. This was a very good proportion for the millmen, but a very poor one indeed for the stockholders in the mine itself. In the Hale & Norcross case, experts proved that $14 rock would pay a profit on the Comstock, but here is an example of $23 rock showing a loss. Under such conditions, unless the mine shows up new and rich development of ore this yesr, assessments will probably have to be levied on this famous mine, which has paid so many dividends in times past. As it is looked upon as the leading and representative mine on the great Comstock lode, such an example bodes no good for the stock market. It is bad enough for a large group of mines to be worked continuously for years without paying dividends, but when assessments are imminent on the best of them, people are not apt to invest much in the stocks or have confidence in the properties. The Consolidated California and Virginia was originally two distinct mines, and ss the name implies, they were formed into one property. The record of the mine up to October 1st is as follows: California produced—Gold, $23,395,273.01; silver, $23,473,804 97; total, $46,869,074.98. Consolidated Virginia produced—Gold, $29,377,441.91; silver, $36,234,233.14; total, $65,611,675.05. Consolidated California and Virginia produced—Gold, $8,209,145; silver, $9,355,643.06; total, $17,564,788.09. Grand total—Gold, $60,981,856.92; silver, $69,063,681.17; total, $130,045,538.08. Dividends — California, $31,325,000; Consolidated Virginia, $42,930,000; Consolidated California and Virginia, $3,682,800; total, $77,932,800. Only about $300,000 in assessments were ever collected, and this in the early days of the mine.

The organization this week of an electric power company for the city of Sscramento is the initial step of a very important enterprise. The directors are residents of San Francisco, who have already subscribed for $600,000 worth of the $1,500,000 capital stock. They intend not only to furnish light, and build and operate an electric railroad of 16 miles in length, but to furnish electric power for manufacturing and other purposes. The original source of power is the American river, where it falls over the dam at Folsom. This dam we have already described in the PRESS. The distance from the dam to Sacramento is about 20 miles in an air line. The Sacramento Electric Light and Power Co. will, by contract with the Folsom Water Power Co, receive a large portion of the power of the latter company, and, converting it into electricity, transmit it to Sacramento. The dam is 210 feet above sea level and is therefore about 175 feet above the level of Sacramento. The basin or reservoir above the dam is upward of three miles long and has an area of 5,850,000 surface feet. The dam is fitted with a timber shutter operated by hydraulic cylinders, and which, when closed, will raise the water six feet over this area, adding to the contents of the reservoir 35,100,000 cubic feet of water. There is then created a reservoir containing a reserve of more than 13,000,000 cubic yards of water, and there is, in addition, the daily flow of the river. There is an abundance of power developed at the fall, which will be electrically distributed at Sacramento. This should be of the greatest importance to the industrial advancement of that city, which will have the advantage of any city in the State in obtaining cheap power for manufactures.

Lake is one of the counties of California which has made comparatively little progress owing to its lack of railroad facilities. Stage-coaches and freight-wagons still hold sway within its boundaries, and communication with the outside world is slow and expensive; but at last a project is under way to build a railroad from the margin of Clear Lake, at or near Lakeport, to a point on the San Francisco & North Pacific railroad. This is only a distance of 20 miles, and electric-power is talked of for the new road. A company has been formed to build it, and also to build and navigate steamers on Clear Lake to connect with the road. Lake county would receive a large amount of tourist travel could the great lake itself be readily and conveniently reached. As it is now, however, it takes too long to get there from San Francisco, and people accustomed to railroad travel dislike to go when they have to "stage it." It is stated that the Clear Lake & Russian River Railway and Navigation Company is in earnest about building the proposed road at once. The natural resources of the county have never been properly developed, owing to lack of suitable transportation facilities. It would take a railroad to induce immigration there and make the lands valuable. The sooner it is built the better.

The Proposed Union Depot.

The *Report*, *Bulletin* and *Call* of this city, and some of the interior papers, are opposing the proposition to he voted for at the coming election to allow the State Harbor Commission to issue bonds for $600,000 for the purpose of building a depot at the ferries at the foot of Market street, San Francisco. The grounds of the opposition are that the State ought not to build a depot for the railroad company and that the company should build the depot itself. As the only available land on which the depot can be built belongs to the State and cannot be sold or leased, it is not clear how the railroad company could well build there. In fact, there seems to be a misunderstanding about the matter. It is the intention to build the depot from revenues received by the State Harbor Commission, just as the seawall, wharves and other public works are built. But the annual surplus, sufficient to construct the depot, is so small that it would take eight or ten years to finish the building in the ordinary course, so that the Harbor Commission wishes to mortgage its income and put up the depot at once on the sections of seawall already completed. The legislature passed what is known as the "Depot Act," authorizing the issuance of $600,000 bonds, but this must be ratified by a vote of the people of the State. The depot will be built in any event, as it is a necessity, and the only question is whether it will be done at once, or drag along for eight or ten years. It is a question of waiting for the money to accumulate, or raising it at once through the bonds. It is represented by those opposed to the measure that the depot will be for the exclusive use of the Southern Pacific Company, and the idea is conveyed that the company will control it entirely. It is a fact that they will use the larger portion of the depot for the simple reason that they do most of the railroad and ferry business here, but it is also a fact that the Saucelito and Tiburon ferries and railroads will use the building, and all of them must pay rent to the State in proportion to the room they occupy. The two small depots already built on the belt railroad on the water-front bring an income to the Commission of $1800 a month; and the present ferry depot at Market street also brings a monthly income of $4750 from the Southern Pacific. The very general prejudice against the Southern Pacific and its methods, naturally militates against the company when the people have an opportunity to express themselves, or to act, as in this instance. At the same time it should be understood that the people are not asked to pay anything in this case more than would have to be paid under any circumstances, since the depot will be built from the Harbor Commission funds in the end and not from any direct taxation. It is only a question of building at once, or building gradually. The railroad company must pay rent to the State and will probably have to pay more in the new depot than they do now. At present the depot is entirely inadequate. It is small, crowded and inconvenient in every way. Not only the immense crowds who use the place daily on the ferry lines are incommoded, but also all who come overland or from the interior on the railroad lines. The travel of the entire State concentrates at this point and a suitable depot is a real necessity. It is unreasonable for the people to let their prejudice against the railroad company blind them in a case of this sort. No doubt the company would be glad to get the land and build the depot for themselves if they could. That is, however, impossible. That the company has undue influence with the Harbor Commission is no argument, even if true. They seem to have undue influence almost everywhere and exercise it as they please. But because of this the traveling public should not be submitted to inconvenience for years and the city be disgraced by a tumbledown depot not large enough to accommodate those who use it. This new depot is intended for passengers only, and they are the ones who will suffer if its construction is deferred. The railroad company does not seem to care very much for the comfort of its patrons, one way or another, and if the people refuse to build the depot, the company will let them get along the best way they can.

The water-front of San Francisco does not belong to the city, but to the State. When the United States gave to the State of California the marsh and overflowed lands, most of these were sold, but what constituted the water frontage of this city was retained and still continues to be State property. The revenues derived from wharves, tolls, etc., all go to the State; but of course the State, through its Harbor Commission, must build and maintain the wharves and depots. The revenue is used for building seawall, wharves, for dredging, etc. It is a mistaken idea that the railroad companies or ferry lines use the wharves and slips free. They must all pay for the accommodation. The Southern Pacific, for instance pays $700 a month for each of the five slips used by the ferry boats, and $1250 per month for use of the present depot building at the foot of Market street. This makes $4750 per month.

With what the Harbor Commissioners get from the railroad company as rent, and from fruit stands, express company, post office, advertising, etc., they obtain a total monthly rent of $2185 for the little depot they now have; and in addition get $3500 a month, as stated, for the ferry slips. The railroad company is only one of the tenants. The Southern Pacific also pays $900 a month for the Lombard Street slip and depot on the belt railroad, $1600 a month for the Second Street wharf, and $800 for switching cars on the belt railroad. So, for all the slips, depot and belt road, they have to pay $8050 per month. In addition the average payment to the Harbor Commission for tolls collected is about $4500. So altogether, the Southern Pacific pays the State for accommodation on the water-front of San Francisco over $150,000 a year, a sum far beyond what most people imagined.

These figures are given simply in order that those not familiar with the matter may have a clear understanding of the fact that whatever accommodation the railroad companies get on the water-front of this city they have to pay for. It is the same with the Saucelito and Tiburon ferries and railroads, which pay proportionate rates for what they require. The building of the depot entails no increase in taxes. The roads cannot buy or lease this State property, and there is no place on the water-front not belonging to the State. No one railroad company can control the proposed depot for all roads have a right to demand landing and depot facilities, and must pay for them. Every individual or company is simply a tenant of the State. In other places the companies build their own depots, but the circumstances are such that they cannot here, if they want to do so. A union depot at the foot of Market street is an urgent necessity for the accommodation of the traveling public, and it will be a great mistake to vote down the proposition to build one, now before the people.

Coast Industrial Notes.

AN artificial stone manufactory will be started at Los Angeles.

NAPA is to have the railroad depot lighted by electricity from a tall mast.

SACRAMENTO CITY is spending between $20,000 and $25,000 this year in strengthening and raising its levees.

MARICOPA county, A. T., will spend this year not less than $50,000 for building and furnishing new school-buildings.

A TELEGRAM announces the shipment of about $60,000 in gold from the Alaska Treadwell Mine of Douglas Island. It will come by the next steamer.

AT a special meeting of the Board of Supervisors of Marin county, M. G. Elmore and C. B. Greene of San Francisco were granted a franchise to erect an electric-light plant at Saucelito.

THE Mount Diablo Mining Company's mill at Sodaville has been shut down for the purpose of making some alterations and a general cleanup. It will require about two weeks' time to make the changes.

THE Standard Con. Mining Company of Bodie is pushing the work of constructing its electric-power plant and it is the calculation to have it in working order by the 1st of December. The poles are all set and the wire on the ground.

CHARLES BEAN, Mrs. Jessie G. Olin and Henry Hart, property-owners on the Mabury road, have filed a notice of intention to form an irrigating ditch company to conduct waters from the Penetencia creek, Santa Clara county, southerly to Mabury road, where they will be divided and distributed along the line of the signers' property.

OWING to the large number of men on the employment books and such a limited amount of work to be done at Mare Island Navy Yard, only veterans are now enrolled unless in some particular case. Veterans may have their names placed on the books at any time, and they are to have the preference over all others in employment.

A SPECIAL train of 20 cars of walnuts has been shipped from Los Angeles. Nearly 20,000 pounds of walnuts were placed in each car, and the estimated value of each carload is about $2000. This is the first train of this character which has been shipped across the continent, and the occasion is an interesting one to shippers of California products. The nuts are the products of the Los Nietos orchards.

THE buildings for the new meat-packing establishment at Rodeo are ready for the machinery, which will be placed by December. The big reservoir, which has a capacity of one billion, one hundred million gallons of water, is also constructed and being filled with mountain water. The packing houses and town of Rodeo will be supplied from this source.

REAL estate throughout the country is suffering from the customary bad influence of a national election. Probably no branch of trade is affected more by politics than the real estate market. The fact that business in this line has been uncommonly dull in San Francisco this fall should give nobody cause for alarm. It may safely be said that as soon as the returns are all in, the market will resume its customary activity.

A RECENT Fresno dispatch reads: "A report from a majority of the vineyards says that the raisins are drying very well in spite of clouds and threatened rain. In some vineyards the precaution has been taken once or twice to stack the trays on account of the lowering condition of the heavens, but in each case it proved an unnecessary precaution. The raisins are rather surpassing expectations. They are not only of a quality better than had been expected, but in most vineyards the yield is above the calculations earlier in the season. The shipping of large quantities of the second crop north for brandy will furnish a profitable way to dispose of that product and at the same time will tend to lessen the total output of the raisin industry of this county, thereby helping to strengthen prices.

THE Chino sugar factory closed its second season's run October 29th, having been in operation since July 1st. Nearly 28,000 tons of beets were worked up, for which the factory paid the farmers $112,000. The total output of crude sugar is 7,903,541 pounds, on which the government bounty is nearly $150,000, making about 200 carloads of sugar. Over 500 hands have been employed in the factory and beetfields, and $150,000 were paid in wages.

THE Pacific Grove Electric-Light and Power Company was incorporated this week. The company which is composed of San Francisco and Monterey capitalists propose to equip a complete system of electrical illumination for Pacific Grove and in addition to electric-lighting will furnish power for propelling an electric street railway, which is to run between Pacific Grove and Monterey. It is the intention of the projectors to push these enterprises to an early completion.

THE Redlands Electric Light and Power Company has secured A. W. Decker, late with the San Antonio Company, as supervising engineer, and he will have complete plans ready in two weeks. W. C. Butler has charge of the civil engineering, and has his plans perfected. R. J. Kennedy has been awarded the contract for 158 feet of tunnel. Contracts will soon be let, and by July 1st next, at the latest, light and power will be supplied. The company now has $20,000 in cash on hand.

THE directors of the San Francisco and Santa Clara Valley Railroad Company have ratified a bonded indebtedness on their proposed railway covering the cost of construction of the line. One of the gentlemen interested said that the bonds had been placed covering the cost of building the first section of twenty-five miles, and the balance of the bonds would be accepted as soon as the first section was completed. Construction work will soon commence from a point on the bay near Mayfield.

SAYS the Dunsmuir News: Mr. Wheeler is putting up a sawmill for the Red Cross Company on Soda Creek which will be, when completed, the largest mill in this part of the State. It is 206 feet long by 40 feet wide, two stories high. Besides the big circularsaw there will be a bandsaw, cut-off saws, etc. The mill will have a capacity of 100,000 feet a day, and will cut timbers 60 feet long. The lower floor will be used as a shinglemill with a boxfactory and fine cut connected.

ALL the cribwork on the Oakdale dam is now done, and it is a solid-looking structure. A new tramway has been built across the river just below the dam, and large, heavy rocks are now being dumped in. The work of strengthening the dam below will be completed before any attention is directed to the upper side. The water now flows through the cribs. The work of tightening will be accomplished with straw, brush and rocks. The superintendents propose to devote two week's time yet on the work, although the dam will be ready for its purpose before that time.

THE engineers of the San Francisco and Great Salt Lake have completed their surveys to the State line. It is said that satisfactory grades have been established on the Sierras and also over the Alameda county hills. The profile work remains to be done and then the cross-sectioning preparatory to actual grading will be undertaken. It is now known that the 200 acres of land on the Contra Costa shore purchased in September last and transferred by Thomas B. Bishop to E. L. G. Steele are intended for the terminal facilities of the new road on the east side of the bay.

PLANS are being prepared at Washington for a 40-ton locomotive traveling crane for the Mare Island Navy Yard similar to the one just completed in the East for the New York yard. It is to be operated on a track extending around the sides and head of the stone drydock and will convey armor plates such as are now used weighing many tons, to any place desired. It will cost about $40,000 and will be the largest traveling crane on the coast. A smaller crane, capable of lifting 12 tons, is to be erected on the wharf just south of the entrance to the drydock.

FOR years past, there has been talk of building a reduction works at Los Angeles. At last, however, work has been begun to clear the ground for a plant, and all the necessary machinery is reported to be contracted for. The works are to have capacity for working 200 tons of ore per day. Thousands of tons of ore are in Inyo county, within 200 miles of the new works, but cannot be sent there until the gap of a little over 100 miles of railroad shall be closed between the mines and Mojave. In the meantime, all the ore of Inyo is hauled over two ranges of mountains and 600 miles to San Francisco.

M. P. PALMER, who is engaged in the building of the San Joaquin water ditch, reports rapid progress in that grand enterprise. He says that he has eighteen men at work, and has already completed about two miles and a quarter of the work, leaving a mile and three-quarters yet to complete, which will be accomplished in about five weeks. The ditch has a carrying capacity of 5000 inches, which it is calculated will irrigate about 3000 acres. Next year Mr. Irvine proposes to build a dam in Santiago canyon that will contain a large body of water—about a mile and a half long by half a mile wide.

THE contract for the construction work on the S. P. railroad between Santa Margarita and San Luis Obispo has been let to Geo. Stone & Co. of San Francisco for $1,500,000. This includes some 8000 feet of tunneling, and it is estimated it will require 15 months to complete the contract. The rest of the gap from San Luis to Ellwood will be comparatively easy work, and nothing will be done on this part until the tunnels are almost completed. The largest tunnel is at the summit of the Santa Lucia range and is 3700 feet long. Seventy-pound steel rails will be used in the construction of this road, and when completed it is to be used as the great overland tourist route of the Southern Pacific. Camps have been established and work actually commenced at all the tunnels. As large a force as can be conveniently managed will be kept constantly at work until the road is completed.

MILL CREEK, in Visalia, is used by many as a sewage outlet, and a thorough and frequent flushing became necessary. Mr. C. S. Richardson, of Visalia, has devised a method of flushing which he recently put into practice. The plan used by Mr. Richardson is this: On the bank of the creek in the eastern part of the city he bored a 7-inch well 44 feet deep. The water in the well rises to within three feet of the surface. The well is cased and the pumping is done by a two-horse gasoline engine using a 2½-inch centrifugal pump. A dam is placed in Mill creek 90 yards below the pump and another above the pump. Between these two dams are collected 125,000 gallons of water, which required about ten hours easy pumping. This body of water was turned loose, and sweeping down the channel of the creek carried off the stagnant waters and impurities. Those who watched the process think it a success. Mr. Woodin, of Woodin & Little, the pump-dealers of San Francisco, was present and was pleased with the plan. The creek will be flushed twice a week for the present.

THE latest plan of the Spring Valley Water Company in the storage of vast supplies of water which in future will be necessary for the requirements of this city and vicinity is to construct an enormous reservoir on Calaveras creek, about ten miles from the bay. At that point there is a large depression in the hills, which, by the construction of a dam about as large as the one at San Mateo, will enable the company to impound a quantity of water equal to the amount which can be impounded in the San Mateo reservoir, or 29,000,000,000 gallons. This is sufficient to supply this city for 900 days, calculated on the present consumption. The company has already acquired thousands of acres on Calaveras creek, or enough to give them an uncontaminated watersbed. The water from the Calaveras lake will be brought to this city around the lower end of the bay by a pipe line. With the San Mateo and Calaveras lakes, and from its other sources, the Spring Valley Company estimates that it will have a supply of water large enough for a city the size of New York, and be beyond all danger of a water famine.

Personal.

L. W. COLBATH has gone with S. L. Powell, to examine the mines at Monkey Wrench, Nev.

DURING the absence of T. G. Barlow-Massicks in England, H. A. Swan will attend to the business of the Lynx Creek Hydraulic Company, Arizona.

THE Quartz Mountain mill, Amador City, has started up. Mr. Kyle of San Francisco is in charge of the mill and John Palmer is general superintendent.

H. H. WARNER, the great patent medicine man and principal owner in the Seven Stars mining group, near Prescott, is in Arizona looking after his mining interests.

THE Parr mining location, Nevada Co., has been bonded to the Brockington Brothers and W. J. Connors, original workers of the W. Y. O. D., and they will put the Parr in proper shape.

A. C. HAMILTON, superintendent of the Chollar, Potosi, Bullion, Exchequer, Alpha Consolidated, Consolidated New York and other Comstock mines, has been in the city this week.

JAMES MCKENNA, W. H. Crase and W. J. Rogers own the South Idaho mine, Grass Valley. This used to be the A. B. C. mine, and has been consolidated with the O. K. The mine is being prospected.

OTTO VON GELDERN, a civil engineer in the employ of the Government engineers engaged in river improvement in this State, is in Sutter county making an examination of the channels of the Feather river.

W. G. WHORF, of Sutter Creek, Amador county, was in the city last week, and is going East to place certain mining properties. The mines of Amador have generallly made good records for themselves, that and Nevada being the "banner" gold-producing counties of the State. There are still many good claims in Amador which only need capital to become valuable properties.

W. H. FURMAN and Mr. Davidson have resigned from their positions on the Cedros Island Mining Co., and C. B. Richards, L. S. McLure and H. Ingle have been added to the list of stockholders. Judge Ingle has been elected president, and Mr. McLure general manager. The company has been reorganized, more capital put in, and the mines on the island will be worked more carefully in the future.

CRUISER No. 6, to be known as the Olympia, is to be launched from the shipyard of the Union Iron Works, Saturday, Nov. 5th. The vessel is 354 feet long and 34 feet wide. She is larger than either the San Francisco or Charleston, being of 5700 tons register. There is yet a year's work to do on the ship after her launch, putting in the engines, boilers, fittings, etc. Many invitations have been sent out, and an immense crowd is expected to witness the launch.

THE Department of Civil Engineering and Astronomy of the University of California announces an "extension course" and organized a class in general astronomy at the Chabot Observatory, Oakland, this week. The course is not limited to university students, so that any one desiring to join the class may communicate with Armin O. Leuschner, Berkeley.

Mines and Mining in Nevada County.

By Our Traveliog Correspondent.

Part III.

GRASS VALLEY, Oct. 10, 1892.

TO THE EDITOR:—Mining men generally report that the present season has been an unusually good one for the mines in here; that there has been far more activity than in several years previous, and the probabilities are favorable for its continuance, and an augmenting of new enterprises.

About Grass Valley these new operations are more numerous and noticeable. They have not all started within the past year, but it is during this time that they have begun to assume the pretentions of a mine. The older operating mines have run on steadily, very much as they have in years past.

THE IDAHO.—It is customary in the other mines to speak of the levels as run every hundred feet on the incline, which gives a much less vertical depth. From the statements of Mr. Ed. Coleman it is to be believed that the lower levels are not showing as it was hoped they would. As the mine is worked out above the 1800-foot level, if a new and lower chute is not struck in some of these deeper workings, it may not be long before we hear of the great bullion producer closing down. The expense of keeping this mine open is tremendous, owing to the heavy and continued timbering throughout its great depth and length, and by a mine less rich could not be borne. But at this late day it is considered impracticable to sink a new shaft, hy which the ore might be hoisted direct to the surface. Now it is necessary to run the ore out 1000 or 1500 feet to the bottom of the lower incline; there it is lifted 2000 feet to the 1000 level by the underground hoist; thence, 400 feet by a tunnel to the upper shaft, and finally hoisted to the surface, 1200 feet more.

The Idaho Company has been anxious to secure the adjoining Maryland ground, and the Maryland, represented by Mr. S. P. Dorsey, also an owner in the Idaho, is desirous of the Idaho works to develop its own property. But each seems to ask more than the other cares to pay.

THE MARYLAND is an extension of the Idaho, as the Idaho was of the old Eureka. This is proven beyond a doubt, as the Idaho, in its richest portion, on the 1600-foot level, worked to the Maryland boundary and gouged a short distance beyond, which at the time caused some legal complications, readily settled, however.

The Maryland has hoisting works and a shaft 350 feet deep. Nothing is doing, and no prospects of activity for some time to come.

THE EMPIRE MINE.—This is the oldest working mine in the State, and under the superintendence of Mr. G. W. Starr, has developed into one of the higgest and best. The present outlook is said to be better than it has been at any time during the past five years. During the past six months the 2000-foot level has been opened up. A north and south drift is here run ahout 400 feet. At this point the ledge flattened to less than 30° which necessitated a crosscut from the shaft a distance of 300 feet. It is expected that the ledge will shortly dip again and run into the shaft.

During the late Admission day celehration in Grass Valley, Mr. Starr gave a public reception at the mine. Each guest was presented with a handsome souvenir of ore from the 2000-foot level, commemorative of the mine and the occasion.

The rock at this depth is high grade, carrying as much as $30 in free-milling and $150 in sulphurets. Stoping is going on in the 1800 and 600 levels. In the latter a fine chute has lately been opened up, running as high as $40 a ton in free-milling. The mill is 40 stamps. Sixteen Triumph concentrators are in use. The sulphurets are sold to the highest hidder.

W. Y. O. D.—The mine is owned by Weissbein Bros. Bankers, Grass Valley. Mr. D. N. Coflin is superintendent. This property is pointed to as an example of the mining possibilities of the district. A year ago it was only a "prospect" like dozens of others; capital, however, and intelligent enterprise took hold of it and to-day it is one of the "big mines." Its success, of course, has encouraged others; and give most any of them the opportunity and the result would be similar.

The mine is a short distance west of the Empire, on a parallel ledge. It has a 10-stamp steam mill, completed a year ago; also four Frue concentators. It is developed hy an incline 950 feet, and north and south drifts on various levels a distance of 300 feet. Stoping is going on in all at the same time the shaft is sinking.

The other mines of this group are in the prospect stage of the W. Y. O. D. of a year ago.

THE LAUREL, or known as the Golden Treasure is the south extension. Frank Dulmaine is superintending it in the interests of an eastern company which has leased it. It has a small steam-hoisting plant and is sinking to strike the ledge with a vertical shaft down nearly 200 feet. It has started within the past three months.

THE PENNSYLVANIA, adjoins the W. Y. O. D. on north. It has a small hoisting plant and five-stamp mill, with one six-foot Woodbury concentrator. Mr. John Eddy is superintendent. The shaft is down 600 feet and sinking. The lead is said to be improving.

THE TELEGRAPH, east of the Pennsylvania with a small hoisting plant, is another promising and deserving property developing slowly for want of capital.

THE OMAHA.—The 28-stamp mill is kept continuously husy on ore said to average $30 free-milling. The sulphurets are saved on eight Frue concentrators and sold to custom. Owing to lack of room for more machines the corrugated belt is used, doing nearly double the work of the smooth belt, though not as thoroughly in regard to the cleanness of the product.

The mine is now opening on the 1500 level. The last year has opened the 13th and 14th levels, and at present stoping is going on in the 11th, 12th and 13th.

The ledge extends north and south, with a pitch of about 30° to the west. Like many of the mines in this district, part of the ledge, the southern extremity, seems to lie in syenite or granite, and the northern portion in slate; though generally with depth, they pass beyond the syenite, except alone in the Allison Ranch group, and enter the slate again. In the Omaha the ore chute pitches southerly into the syenite. It is in the south drifts that the best pay has been found. Mr. Geo. Maynhard is superintendent.

THE HARTERY is a continuation of the Omaha on the south, lying between the latter and the Allison Ranch. Mr. Geo. Maynhard is superintendent. It has no mill but has a small hoisting plant. The incline is down 400 feet and is still sinking. The ledge is small but hopeful. The ore is being stored on the dump and at present is to be crushed by custom.

THE ALLISON RANCH, a very rich property lying to the south, has been idle for some years. It is owned by Mr. Davis of San Francisco, who has refused many large offers by men who wish to develop the property further. The mine was last worked by "tribute," but the "tributers" striking it too rich of a sudden, the pumps were removed and the mine flooded. It is stated that Mr. Davis himself intends reopening the mine next season.

THE WYOMING.—This is another of the "present season" mines. It has a small, 15-h. p. hoisting plant. Mr. B. F. Runnels is superintendent and part owner. The mine is on the south edge of town and started out as a "back-yard" prospect, but it has already, within 200 feet, shown evidences of becoming a good mine. Bunches of rich ore have been frequently met from the surface, and at 165 feet, in an 18-inch ledge, they have come upon what seems a large and continuous body of high-grade rock. The ledge is a north and south one dipping west, supposably on good evidence an extension of the famous Dromedary of early days.

THE CENTENNIAL.—The Centennial is chief among the Osborn Hill group. It is on the Empire lead, one mile south. Mr. A. W. Stoddart is superintendent and principal owner. As yet there is no mill on the property, though the company is looking toward the erection of a 10-stamp mill within a short time. It has a steam-hoisting plant, the building being built to receive the batteries at any time. The present management assumed control a year ago. The shaft is 650 feet deep, with five levels, the longest of 850 feet. The ledge is from one to four feet in thickness, and the rock has averaged as high as $100 per ton.

In this same locality are other good mines waiting for capital, as the Orleans, Daisy Hill, Sebastopol, Green Mountain, Lafayette, etc.

THE PEABODY mine of Alf. Tregidgo is idle at present, awaiting the introduction of electric power. This mine, lying to the west of town, is immensely rich, and as soon as it has an adequate plant it will be thoroughly opened up. The shaft is down 400 feet. The serious drawback in working the mine has been the vast quantity of water met with. To handle this it has been necessary to put in two large pumps, one 12-inch and one 8-inch. Mr. Tregidgo is also operating the Hudson Bay, a prospect with small hoisting works, and previously a good mine.

The famous Gold Hill mine, lying just to the west, is also idle and full of water, awaiting the advent of electricity. Splendid new hoisting works and new pumps have been put in, preparatory thereto and in anticipation thereof.

THE NORTH STAR.—This is the biggest and deepest mine, aside from the Idaho, in the county. It is 60 feet below the 2300 level and sinking for the 2400 level. It is fully opened to 2200 feet, the lowest stope. The main work is all helow 1800, and in the west drifts. The ledge at the lowest point continues strong. The mill is of 40 stamps, 16 concentrators—12 Triumphs and four Frues—and the best equipped mill in the district. Mr. E. R. Abadie is superintendent.

CENTRAL NORTH STAR.—East and adjoining the North Star is the Central North Star, and supposably an extension. The North Star ledge differs from others of the locality, as the Omaha, in that it is a cross or east and west ledge, dipping northward. The formation is of slate.

Mr. James Bennalack is superintendent of the Central. The mine is still a prospect one, with steam hoisting works. The shaft is vertical, and to a depth of 250 feet. At 150 feet a crosscut was run 120 feet to the ledge, showing good milling rock. With greater depth the shaft will cut the ledge, when still better results are expected. The shaft was sunk thus in order to fiind the ledge, as no surface croppings showed.

The St. Johns and Evening Star, both without mills, are reheginning active operations.

THE HERMOSA, another young and hudding property, is owned by Dave Mauvick and other Grass Valley capitalists. It has been slowly developing for the past two years. There is a steam hoist, and a shaft 500 feet deep on the ledge. At this level a north and south crosscut has heen running, and within the past couple of weeks a good body of ore is reported to have been found.

THE MERRIMAC.—This is on the extreme east houndary of the Grass Valley district, 2½ miles from town. The ledge is in slate, strikes east and west and dips to the north. In fact there are three ledges, two parallel and one cross ledge. The mine was worked as early as 1851 and proved rich, even with the then crude methods. Within the last year Mr. C. E. Clinch and a company have taken it to open in permanent form. It has a good, suhstantial steam hoisting plant and will doubtless have a mill hefore another year has passed. The shaft is down 550 feet, in ground heretofore unworked. Good crushing rock is now being extracted and milled at custom. The ledge at the bottom runs about 15 inches in width. A crosscut is heing run at 500 feet. This company is also contemplating the introduction of electric power. Mr. Chas. Stocks is superintendent.

THE COE mine has lain idle for a year. San Francisco parties had it honded, but owing to a disagreement of management the hond was released. The owners are now considering a plan for the resumption of operations. It has a hoisting plant and a 500-foot shaft, but no mill. It is considered a good paying mine.

There may have been more space given to the small properties than their present importance would seem to justify, hut it is on these mines that the future of the section depends. The large producers are limited in number as well as to length of life, and all that is wanted to make any of these lesser propositions great is money and time—principally money. For this, there is a crying need. This is all the more strange, too, for with quartz enterprises here success may be said to be uniform. There have been failures, trnly, but they have been most invariably the result of mismanagement or lack of funds, for under proper direction they have proven the greatest successes. Of course there must have been the first assurance of a ledge. But even this result of past experience seems insufficient to overcome the diffidence of capital to investing in a ledge that averages 18 inches and seldom exceeds two feet in thickness. Men of means and mining proclivities look for a Colorado silver lead in a Grass Valley gold lead.

CHAS. E. TOWNSEND.

A Private Letter and a Public Answer.

SAN FRANCISCO, Oct. 31, 1892.

TO THE EDITOR.—I have received a letter, which will, I think, amuse such of your readers as may honor with their approval, or the reverse, my efforts to promote the consumption of printers' ink. To save you the trouble of deciphering the "hieroglyphics" of my correspondent I transcribe as follows:

C. H. AARON, Esq.—I have just read your article io the MINING AND SCIENTIFIC PRESS of September 3d, criticizing tbe chemical views of M. T.; would you please write another article and tell us what it is all about? Anybody could sit dowo and io three months read up enough chemistry to understand tbe symbols aod oomenclature used, but the most of us baven't done so, and doo't intend to. It is always bad taste to talk shop io general compaoy, it is more, it is affectation aod traosparent cooceit. Some of us can get along io Latin, Greek, Freoch and Italiao, but we doo't give an order io a restaurant in aoy of these languages to a waiter that only knows Eoglish. Hence, for tbe same reason I am not writiog to you io Latin. Always remember that tbere is oothing in tbis world that tbe next man can't understand if it is properly explaioed, and the day is past wbeo people stood in awe of a danciog dervish decked in gowo covered witb bieroglyphics. We cao all be made to comprehend why cyaoide dissolves gold in some cases aod does not io others without torturing the alphabet till we bave it squirming and wriggling about in a newspaper columo as if it had an epileptic fit. Respectfully,

JAMES SMITH.

If James had written his usual neat and legible hand, also giving his real name and address, we might have arranged matters by private correspondence; as it is I wish to reply:

DEAR JIM—I am sorry you don't like symbols. Chemists like tbem, so do I, though hardly a "professiooal cbemist." I thiok you will cbange your mind on further coosideratioo. Symbols simplify cbemistry aod tbey are so ecooomical; for example, which would you prefer in yours: Monomethyldiethylisohutylammoniumindide, or just plaio, $C_9H_{22}NI$? With all *due* respect,

C. H. AARON.

Deep Coal Seams.

It is commonly known that the disposition of the coal seams upon the Continent necessitates the carrying on of mining operations at very considerable depths. In Belgium, and in the center of France particularly, the thin upper seams are being fast worked out, and it is found necessary to go deeper, with the result that richer deposits are being discovered. At the same time the difficulties of mining are greatly increased, and this is strikingly evident at Flenu-les-Mons in Belgium, where a depth of from 110 metres to 1150 metres is heing attained. In sinking at this depth an enormous "come" of water was experienced, together with formidable blows of gas. The water had a temperature of 50 degrees centigrade. Attempts were made to stem hack this water and gas by the construction of a dam of masonry 2 metres 70 in thickness, hut even this powerful check availed nothing against the force of the water and gas, and it will be found necessary to collect the water in a "sump" and pump it to the surface. In the meantime, these formidable foes to miniog are in constant turmoil and create a noise like continuous thunder. Notwithstanding the seriousness of these difficulties, the proprietors are resolved to overcome them and machinery of a very powerful type has been laid down, of which the pistons have a diameter of 1 m. 25 cm. It will also be necessary to replace wood with iron for supports and other purposes in the lower workings. If the attempts to win the coal in the lower depths of this mine are successful, encouragement will he given to the working of the Rive de Giers deposits which underlie those at St. Etienne.—London Mining Journal.

THE AUSTIN DAM.—The *Scientific American* of September 24th, in connection with an interesting article under the ahove caption, prints on its front cover page three illustrations of the famous Austin Dam, now being huilt across the Colorado river at Austin, the capital of the State of Texas, which is to furnish the city with water works and electric light and its manufacturing enterprises with cheap water power. This dam is notable in that the volume of water which will pass over it is estimated at 250,000 cubic feet per second, which is nearly equal to the volume at Niagara falls, to wit: 275,000 cubic feet per second; hence the great interest attached to its construction. A promineut feature of the lllustrations is the Lidgerwood cahleway, which is shown as used in the building of the dam. This cableway, which is the invention and was erected by the Lidgerwood Manufacturing Company, 96 Liherty street, New York, is the longest hoisting and conveying apparatus in the world. It is 1350 feet span and has a capacity for handling 6½ tons of stone at a speed of 600 to 800 feet per minute, hoisting and conveying and delivering the loads anywhere along the top of the dam, as may he required.

Surplus Horses.

Almost every farmer has his pasture overstocked with unsalable horses that are eating their heads off. Still we keep right on in the same old rut, hoping that the market will be better next year, and reading of the great prices that Stanford, Haggin, Winters and others have received.

The truth is that for the past 20 years production has been out of all proportion to demaud. From 1870 to 1880 the census shows an increase of population of 29 per cent and an increase of horses of 44.95 per cent. During the last decade population increased 22.6 per cent and horses 44.59 per cent. In California the last decade showed an increase of population of 39.7 per cent and of horses a gain of 46 per cent.

In the moantime, extension of railroads has displaced many stages and freight teams; cable and electric power have almost superceded horse cars and made great inroads on livery trade; steam has invaded logging camps and grain fields and settlement is gradually reducing the range territory and the demand for vacquero horses.

On the other hand, the change that is taking place in irrigated sections from extensive to intensive farming requires not less than four times the horses, and the phenomenal records that our trotters and runners have made demonstrate the advantage of a climate where the colt's growth is never checked nor his exercise interrupted, and auction sales in the East of undeveloped colts of approved breeding have been very encouraging. These data explain the apparently contradictory remarks that "There is no sale for horses," aud again, "A good horse will always bring a price."

The truth is, different classes of horses and less numbers are demanded, and as the times have changed we have not changed with them. On freight wagon, stage coach or horse car it did not make so very much difference about the style, disposition or breeding, so long as animals were tough and sound. Vacqueros consider that horse a poor, lifeless stick unless he does responsible bucking when mounted. For these purposes the original mustang stock of California filled the bill.

Now that their vocation is passing away, these horses still keep on increasing. All along the eastern slope of the Sierra Nevada mountains great herds of horses run upon the sagebrush range almost without cost to their owners. Some of them grow gray without ever having been bridled, while others are driven home every winter to be fed and handled. Some of them are the original thoroughbred mustang with bucking attachment, others the degenerate offspring of American stock and still others are grades from imported draft or running horses. Owners reason that it will pay them to raise horses at $25 each. Some of the bands have grown to be wilder than deer or coyotes. By cunniog stratagem or tedious pursuit they sometimes manage to corral a part of them and select some worth driving to market.

Some have been sold at auction in the mountains during the past summer at prices ranging from $2 50 to $10. Others have been driven to the valleys and sold for whatever they will bring, which generally leaves the drover poorer than when he started. During the State Fair at Sacramento, 20 of extra quality that had been worked one season, brought from $10 to $20 each.

Some of these horses finally become gentle and serviceable, while others never get to be so safe, but that the risk one takes every time he hitches him up is more than the use of the horse is worth. Whenever a man buys one of this class of horses for other uses than those named above, he must feel that he is buying a small chance in a lottery. The money that he brings is not enough to make good the loss to the horse-market from this class of overproduction and the feed that he eats would have raised a good steer or six or eight sheep. Often the men who corralled them had to take the pay for their trouble principally in the fun attending the risk of their necks, and the dealer took his profit in horse-trading experience.

If there could be some concerted action for a general rodeo of these range horses and an agreement to slaughter for hides and soap-grease all animals not likely to weigh more than 800 pounds at three years of age in fair condition and also every one with a serious fault in form or disposition the balance would be worth more than the whole and slaughtered horses might be made to net two or three dollars each. Then geld grade stallions; there are too many any way and it is very late in the day to expect a profit from raising, inferior horses.

Present demands are for general purpose, heavy draft, coach, trotting and running horses about in the order named. The ten-acre fruitfarmer wants a horse large enough to draw a 10-inch plow to a good depth in orchard ground; one that is good to cultivate the raspberries or strawberries; that mother or the children can drive to town; that will stand quiet on the truck while he is gathering up his load of fruit and that will step off proudly on Sunday when the family is in the Surrey riding to church.

By crossing upon the deavy draft mares something with style and action we will often get a horse answering these requirements, also, but less frequently, by crossing draft stallions upon mares descending from trotting or running stock. There are large numbers from which this class of horses can be bred by giving proper care to keep the colts gentle and making intelligence and docility essential points in the sire. Two men out of three who want to buy horses are best suited with one bearing about this description.

For trucks, drays, busses, logging-teams, fire-engines, etc., very heavy horses are demaoded, but our importers of Percherons, Clydesdales and shires have been so enterprising that it seems likely to be more profitable to use a part of this stock for breeding a more active general-purpose horse, in view of a prospective oversupply of draft stock.

If you wanted a carriage team worth $1000, that would attract all eyes as you drove through the avenue or park, where would you go to buy them? Visit the State Fair, and among the 800 on its grounds you would have found very few.

Cleveland Bays and French and German Coach are just coming in to fill this demand. Their grades will be likely to meet a large demand as general-purpose horses, and the finer individuals among the thoroughbreds to bring more money than any others, save those whose speed has been proven or such as go upon sale with a popular pedigree. It is hard for one to name any who have made a financial success for a term of years from trotting or running stock, except large breeders of high reputation, who make one of those classes the leading features of their business.

In applauding the few who reach the top of the ladder with their worldbeaters, we forget the many who have fallen by the wayside. As we crown Nancy Hanks, Suuol and Maud S. are retired with Sullivan, the once great, to comparative oblivion. Our columns are not supposed to address a constituency of sporting men, and we know of no way for the farmer or average horsebreeder to grow rich from fast stock, otherwise than by using them as a foundation for developing from coarser strains the good general purpose horse, for which there is so much demand.

Briefly, then, weed out the scrubs. Breed up the best. Use only the better sires. Raise a larger share of general-purpose and draft horses. Put your big money into coach horses. Let the professional horsemen produce the trotters and runners at their breeding-farms, and go to them for top-crosses to produce general-purpose horses.

Ramie Machines in New Orleans

WASHINGTON, Oct. 19.—The board of experts of the department of agriculture, who conducted the experimental tests of ramie machines last month in New Orleans, have made a report which is made public to-day by the department. The trial was for the purpose of ascertaining the capacity of American machines for continuous operation for a day of ten hours, instead of the usual tests of a few minutes. Only three machines were entered for the tests—the "Kauffman," the "J. J. Green" and the "Fremercy."

Owing to delays in transportation, the ramie stalks supplied by contract from the plantation of Colonel Gustave A. Breux in Lafayette were spoiled in transit, and the stalks used were obtained from Captain Willett near Algiers and from the government experiment station.

The experts report in detail what was done by each machine before clogging. Both green-stripped ramie stalks and freshly-cut jute stalks with leaves were tried. The experiments were soon abandoned on account of defects of the machines, and the board of experts decided not to estimate the run of any machine for a day of ten hours based upon these trials, believing the figures would be misleading.

Commenting upon the tests, Special Agent Dodge says: "While the figures for a day's work, based on the results of short running, are wholly misleading, it is interesting to note that the output of the Kauffman machine, during the 42 minutes of continuous work before it clogged, represents 4743 pounds of green stalks in ten hours of continuous action, or a little over two tons; with an output of 1257 pounds of wet ribbons, equal to about 420 pounds of dry ribbons, which weight would be considerably reduced after the loose hurds and woody matter remaining in the ribbons produced by this machine had been eliminated. In like manner, had the J. J. Green machine to run continuously for ten hours, turning out ribbons at the rate of speed shown when in actual operation (that is, deducting the 67 minutes spent in cleaning and readjustment), the output would have shown a capacity of 4821 pounds of stalks and 1232 pounds of wet ribbons, equal to about 410 pounds of dry ribbons. But both machines were unable to finish the 5000 pounds of stalks weighed out to each for the trial.

"The results of the New Orleans trials are satisfactory as far as they have demonstrated the status of the machines entered and established an American record that gives a starting point for future comparison, as the results of other trials are made known. One point demonstrated beyond all doubt at the recent trials is the perishable nature of green ramie, either stripped of its leaves or unstripped, and the experience recorded emphasizes the importance of taking the machine into the field where decortication of the green stalks is carried on. Two or three small bundles of ramie stalks, with leaves cut and tied upon on the Willet plantation before noon of the 29th, had begun to show signs of heating on the morning of the 30th, though the stripped stalks and the remainder of the unstripped stalks were in perfect condition.

"It is an interesting point for future experiment to determine whether ramie stalks can be perfectly dried in this condition for machine working in Louisiana, owing to the greater humidity of this section, compared with other sections of the country suitable to ramie culture. It would seem, from my observations in Louisiana, that slight kiln drying will be necessary, after at least ten days of sun drying in the field, in order that the stalks may be made sufficiently brittle for the machine to separate the woody matter readily, and the question of profitable cultivation is another problem which can be settled only by careful examination on a large scale."

THE LAST THING TO BURN.—He was a simple countryman, but as persistent as he was unsophisticated, and when he once formed an idea or a resolution it stuck to him like wax. He got an impression, how, it does not matter, that some dark, rubbly stuff on his selection was coal, and with all sorts of visions of wealth before his eyes he sailed down to a friend in the Mines Department and worried him for days and days to get an expert opinion on his chunks of rock. The official thought to put him off and wear him down by temporizing, hut the bucolic was not to be put off, and at last the mines man got the stuff reported upon. The verdict was unfavorable, and so exasperated was the Government official at the trouble he had been put to for nothing that his annoyance smothered the sympathy he should have naturally felt for the country friend whose fond hopes were blasted. He readied himself up for a final visit from the owner of the samples, and in announcing the result of the tests to which they had been subjected, delivered himself somewhat as follows: "You believe that at the last day the world will be consumed with fire?" "Yes," answered the amazed and expectant countryman. "Well, then," continued the official, "you just go home and tell your friends that you can make yourself all right against the last day, for the stuff on your property will be about the last thing on God's earth to burn."—Australian Mining Standard.

Deep Gold-Mining.

One of the most interesting and gratifying features of recent mining developments in Victoria, says the *Australian Mining Standard,* is the success attending deep mining operations on the Bendigo field. The days of surface scratching, so far as that group of mines and many others in Victoria are concerned, have long passed, and the persevering effort that has been directed for many years past to testing the deep ground is now meeting with substantial reward. Perhaps the most important work lately performed on Bendigo in connection with deep mining is that carried on by the Garibaldi Company on the New Chum line of reef, and a highly interesting report on this subject has lately been presented by Mr. E. J. Dunn, who has rendered such good service in underground survey work at Bendigo. Mr. Dunn says that the reef now being worked in the lowest level of the Garibaldi mine is the lowest saddle stratigraphically that is being operated upon in the district. The depth of the reef from the surface is 2170 feet, and the height of the quartz is 30 feet, the breadth over the cap of the saddle being 21 feet 6 inches, and at the cap it is 5 feet wide. "Owing to the fact that the Garibaldi mine is situated on the spot where the pitch culminates, all the reefs met with are at higher elevations in this mine than in mines either to the north or the south of it. Southward, this same reef has been broken into by the Shenandoah Company at 150 feet lower level as regards sea level, while northward, at Lansell's 180 mine, the cap of this reef should be cut at a depth of about 2850 feet from the surface, or at a depth of 610 feet more as regards sea level, than at the Garibaldi mine. The bottom of the Garibaldi shaft is now 2280 feet from the surface, and is 140 feet deeper into the strata than the bottom of the 180 mine. It is most satisfactory to note that at this depth the country rock, in which dark or black slate predominates, is as favorable in aspect for gold, and as strongly impregnated with sulphides, as near the surface. It is, in fact, now proved that the lowest zone of rocks yet touched is auriferous, and this along one line of reef alone implies further resources as regards gold of great magnitude. The quartz in the lowest or Garibaldi new reef is seamed with black slate in the manner coosidered most favorable by the mining men. Gold is to be seen freely disseminated in some parts of the exposed lode, and crushings of 1903 loads have yielded 1702 ounces of gold. Measured transversely or at right angles to the strike, this saddle reef has a superficial area of 400 feet. This is taking the reef over the cap of the saddle, and excluding both east and west legs. Taking 12 cubic feet in the solid as a load, the result shows that for each foot in length, where now being worked, the saddle reef produces over £100 worth of gold. Judging from the continuity of all the reefs that have been worked along this line at higher levels, it is reasonable to expect that this lowest reef will be worked for miles in length. Of course it is not probable that such very rich stone will be continuous for very great lengths, nor that such a large bulk of stone will be found for long distances, but similar rich sections may certainly be anticipated at intervals along the course of the reef. There is, as yet, no indication whatever that the full depth of the gold-bearing strata on this goldfield has been reached, and thanks to the splendid pioneering work done by Mr. G. Lansell and others, the oossibility of pursuing gold-mining at a depth of 3000 feet or more has been demonstrated."

Cheapening Treatment of Ores.

Eight or ten carloads of machinery are now at Prescott Junction awaiting shipment to the United Verde Copper Company's works at Jerome. This machinery belongs to the refinery plant to be erected at that point, upon the completion of which the shipment of matte from Jerome will be a thing of the past, as the pure copper will be shipped instead. This will be a great saving, both in freight and treatment of ores, to the company, and, of course, will enable them to work a vast quantity of ore which they have not been able to handle. Every move which cuts down the handling of ore one dollar a ton gives that much more margin to the mine and makes marketable a vast quantity of ore. In this way, and in this way alone, will this section be made to come to the front. Many enterprises have fallen through in this section because capitalists insisted upon having dividends before a plant sufficiently complete was on the ground to do justice to the mines. It is contended, and backed up by good argument, that the Howell camp, on Lynx creek, would to-day be one of the greatest in the southwest had complete works and a refinery been put up at that point to start on. There are two classes of miners who have, with hardly an exception, made money in this section. The first class comprises the clear-headed Arizonian, who stuck to the most primitive methods, and, with little expense, run his arrastre and took out his own ore with the help of a partner, or, if the ledge justified, hired help; the other class is composed of nervy capitalists who, having satisfied themselves as to their properties, stop at no expenditure until they have a plant on the ground complete enough to treat their ore in every process that it may require. There is no half-way stage in quartz-mining in this section; it is better to stick to the arrastre than to go half-way on the improved machinery method and fall through.—Prescott (A. T.) Courier.

Mechanical Progress.

A Brief Fire-Engine History.

It was not till 1860 that steam fire-engines came into use, although floating fire-engines had been used on the Thames for some years. In 1863 an account was published in the London Times of a competitive test between English and American steam-fire engines, prizes of £250 and £100 being offered for the best and second best. The result was very much in favor of the old country engines though the American ones certainly had many strokes of ill-luck. The Manhattan collided with a tree and was badly damaged before it reached the competition grounds, and the other American engine, Alexander, broke its cylinder cover at the trial. If such a contest were arranged to-day, the odds would be in favor of the machines built in this country, and no one would doubt this for a moment.

In principle all the fire-engines are alike, whether worked by hand or steam. With the steam-engine lies the advantage of continued action, much greater power and the supply of water at greater heights. No effort is made to economize steam in a fire-engine. The main objects aimed at are the rapid generation of steam and its maintenance at a high pressure ranging from 80 to 100 pounds to the square inch. A modern engine may be said to consist of three parts: A powerful coil of tubular upright boiler, the engine, pumps, air-chamber and the carriage. The greatest attention is paid to making the machinery very strong and very simple. Complicated valve-gearing is not to be thought of. Every portion must be in a position where it can be easily reached and the parts must be such that they can be duplicated speedily. An average fire-engine for use in a large city will have cylinders from six to eight inches in diameter and pumps from three and a half to four and a half inches in diameter, the stroke of both averaging about eight inches. All the larger engines are double, as, though each pump is double-acting, that is to say, delivers on both the up and down stroke, a steadier stream is supplied from double pumps.

The capacity of the largest engine is 800 gallons a minute; the average though is not over 600 gallons. The weight of an engine ranges from 7000 to 8000 pounds, and it will be understood that the very best and strongest workmanship is necessary to withstand the unavoidably rough usage incident to a hurried journey over vile pavements. The fire under the engine is lighted automatically, and as the water in the boiler is kept hot by connection with sanitary boilers at the engine houses, the necessary pressure is attained in a few minutes at the most.

There are probably half a dozen makes of fire-engines in the United States all of which rank as first-class. It would be a very difficult matter to select the best, while to take the verdict of firemen would also amount to little, for men who have run all their lives with a particular kind of engine can see very little virtue in those of any other make. Some cities use almost exclusively one make of engine, and others are just as conservative in the use of another make.—Fire and Water.

The Width of Wheel-Tires in Cities.

The subject of the width of wheel-tires as compared with loads carried on omnibuses, heavy drays, etc., moving over the paved streets, says the *Engineering News*, is brought to the attention of the city authorities of Philadelphia, by Mr. James H. Windrim, Director of Public Works, and Mr. Windrim details some bits of practical experience in this line that will be of interest to municipal officers elsewhere. He says that the omnibuses running on Broad street, in Philadelphia, have an average tire of only 2½ in. During the repaving of Broad street, at an expense of $204,643 in 1892, this omnibus traffic was diverted to side streets with lighter pavements. The result was that in 14 days damage to the amount of $6000 was done in displacing paving, broken crossing-stones, sewer manholes and stop-boxes for gas and water. This all happened in an area of 16,635 sq. yds. of street pavement.

It is altogether probable that the damaged side street referred to was of the more antiquated type of street-paving in that city and was stone-laid on an earth foundation. But undue concentration of load should also be avoided in the traffic over a modern pavement with a concrete base, and its greater first cost is only an argument for its better preservation. We pay altogether too little attention to the subject of tire-width, both in our cities and in the country, and it is time that we were putting into practice regulations that have long existed in other countries. We have failed to find any specific American city ordinances on this head, and the late road-law of the State of Michigan, simply providing that users of wide tires are entitled to a rebate of half their road tax, is a rare exception in State legislation of this character.

English road-laws provide that where the load per wheel is from one-half to three-quarters of a ton, the width of tire shall not be less than 3 in.; where the load ranges from three-quarters to one ton, minimum width shall be 4 in., and from one ton to one and one-half tons per wheel, the tire must be at least 6 in. wide. Vehicles with springs may reduce this tire-width 1 in. This law practically coincides with German and French regulations on this subject. To meet this English law the Broad-street omnibuses complained of should have had tires 5 in. wide instead of 2½ in.

The effect of narrow tires, with a heavy load, upon modern street-paving has not yet been carefully studied and reported upon. But it needs no special study to convince an observer that present practice imposes heavier duty upon such pavement than is necessary, in the face of possible municipal legislation. In the case of stone blocks a broad tire may distribute the imposed load over the base of two blocks instead of one, and in the case of an asphalt pavement ruts are much less likely to occur than with the narrow wheel.

But as the change of wheels would be a costly operation in the aggregate, the salient question is, how can this be done with the least damage to individuals? There is no doubt that a compulsory law could be framed and, if need be, enforced. But the better plan would probably be to directly tax the user of narrow tires under heavy loads, and to free from all tax the men who conform to established regulations. Such an arrangement would give time for the change and yet contain an inducement for as rapid a change as possible. This is practically the same principle that now induces the owners of certain newly-built country roads to remit tolls on such vehicles as conform to published tire requirements. Broad tires are certainly better for use on soft or yielding roads; and on paved or well-built macadam roads the tractive force is independent of the width of tire, provided this width exceeds 3 or 4 in. To the objection that English wheels are clumsy and we will not have them, it can be answered that if broad tires are made the law, wagon-builders will soon eliminate the clumsy features. In the majority of our cities, the same street conditions exist that caused the marked failure in Philadelphia; and in such cases, at least, it is conclusively proved that some law of this kind is necessary and that its enforcement would be economical to the community. It seems a bit unwise to adopt modern street-paving methods, and yet to refuse to use every reasonable precaution for the better preservation of these costly pavements.

PRINCIPLES GOVERNING ENGINES.—In his most recent work on the steam-engine Professor Thurston says that the principles that must govern the engineer in his attempt to select the most efficient type of engine are as follows: (1) The greatest practical range of commercially economic-expansive working of steam. The fluid must enter the cylinder at the highest admissible pressure and must be expanded down to a minimum economical pressure at exhaust. (2) The wastes of heat must be made a minimum. All loss of heat by conduction and radiation from the engine must be prevented if possible and the usually much more serious waste which occurs within the engine by transfer of heat from the steam side to the exhaust, by "cylinder-condensation" and reevaporation, without doing its proportion of work, must be checked as completely as is practicable. This latter condition as well as commercial considerations, limits the degree of expansion allowable. It also dictates high speed of engine. (3) The largest amount of work must be done by the engine that it can perform, with due regard to the preceding conditions. This condition compels us to drive the engine up to the highest speed and to adopt the highest practicable mean steam-pressure —Power.

IT is stated that a form of ball-bearing has been applied to the spindles of textile machinery, and by its use it has become possible to run at enormously high rotative speeds. From 8000 revolutions per minute is the speed usually attained, and even 10,000. It is claimed that speeds as high as 16,000 can be reached.

TO MAKE a glue that will resist the action of water, boil one pound of glue with two quarts of skimmed milk.

Scientific Progress.

City Refuse Disposal.

Experiments made in Naples show that the street-sweepings there are 1319 times richer in living bacteria than ordinary liquid sewage, and in Munich the living bacteria found in one gramme of street-sweepings ranged from 8000 to nearly 13 000,000 These experiments show that this material is peculiarly favorable for cultivating the micro-organisms, and rain upon it facilitates this growth. The volume of street and house refuse, separate from human waste, is enormous in a large city, and the returns from six English cities, including London, Liverpool and Leeds, show an average volume of about 180 tons per 1000 inhabitants per annum. The treatment of this 300 000 to 400,000 tons of refuse in New York is a serious problem, involving enormous annual expenditure. But the present disposal practice is crude and unsafe, and something better should be done.

A recent proposition, says *Engineering News*, to dispose of about 10,000,000 cu. yds. of New York refuse by filling in about 400 acres of Long Island Sound, east of and adjacent to Riker's Island, might be temporarily a relief, as far as transportation is concerned; but from a sanitary standpoint, such disposal is certainly open to serious objections. The cost of burning refuse in properly-designed furnaces ranges from 12 to 54 cents per ton, according to statistics gathered by Mr. Boulnois, the city engineer of Liverpool; and in a destructor lately erected by him for Liverpool, the cost is 30 cents, exclusive of interest on the plant, and each furnace, of from 8 to 10 tons capacity, cost about $4000. For the city of Edinburgh, Prof. George Forbes proposes the use of the ash-bin refuse as a fuel for generatiog electric light. But as the refuse consumption must go on contiouously, and the light is only needed at night, he proposes to use the fuel for pumping water into a storage reservoir and then converting this stored water into hydraulic power, through turbines, to run the dynamos Prof. Forbes estimates that for this service 10 pounds of ordinary ash-bin refuse is equal in fuel value to one pound of common coal. This plan requires favorable local conditions for its successful operation and the still more difficult condition of a more perfect system than we have for separating and collecting garbage, street-cleanings and house refuse.

Other great cities find refuse disposal quite as serious a problem as does New York. Berlin removes its street-sweepings to a safe distance beyond the city limits and takes especial care to prevent it from contaminating water-courses. London treats its sewage chemically, but until lately, at least, permitting the sorting of its street and house refuse—a practice which is properly condemned as leading to the possible introduction of foul and infected matter ioto the slums of a city where it is liable to do most harm. Liverpool, in 1891, sent 145,032 tons of refuse to sea in dump-barges at a cost of 37 cents per ton, including the loading. But as in New York, complaint is made that this system breaks down in stormy weather and the matter is dumped at points from which it is washed up again on to the shores. A garbage-collecting company in St. Paul, Minn., is now entering into a contract with the city authorities to collect garbage, on alternate days, in tight hardwood barrels, and to utilize this material in converting a sandy district of 10,000 or 12,000 acres, at some distance from the city, into a market garden district. With what success remains to be seen, for previous attempts of this kind have been very unsuccessful commercially.

In a word, the refuse of a city like New York is very great in volume and includes such a vast variety of rubbish in its composition that the problem of disposing of it is a most serious ooe in its dimensions. Dumping into the sea at points remote enough from land not to interfere with navigable channels, or to be cast back upon the shores, would be doubtless the best immediate solution. But experience proves that it does not work at all seasons, and the supply of refuse is constant and growing. To burn it requires an enormous outlay for plant and maintenance, and care that the operating is not a nuisance to surrounding habitations. To attempt to separate it according to its fuel value is almost impracticable; and to permit culling by contract for rags, iron, tin, etc., is to invite disease into quarters already too dangerous and difficult to watch. But when we consider that the sanitary well-being of two millions of people may depend upon the manner in which this refuse is disposed of, it is seen that some intelligent solution of this complex problem must be reached.

Modern Development and Uses of Fuel.

At the recent annual meeting of the Society of Chemical Industry, London, Prof. J. Emerson Reynolds, Professor of Chemistry at Trinity College, Dublin, in the course of an address, said that the people of England were too much prone to presume that coal would always be a cheap fuel, and that the supply was inexhaustible; but both assumptions could be shown to be erroneous. The reasons for concluding that coal could not very long remain a cheap fuel were not far to seek. Labor combinations in various parts of the world tended to increase its cost directly or indirectly. Those combinations were to a certain extent the consequences of the operation of economic laws, and in so far were not mere accidental factors. The wider distribution of manufacturing activity tended in the same direction, and the increase in depth from which coal must be won led altogether and regularly to greater cost of production. Therefore, some causes which were continuous, and others which were spasmodic in their effects, must make coal dearer. The immediate practical effect of such considerations should be to check waste in the use of coal, but he feared they had not gone very far in that direction as yet, since few realized the extent of the danger ahead. He held that a question pressing at present was how to combine economy in the use of coal with smokeless combustion and domestic convenience. The answer was sufficiently obvious. They must more or less completely gasify the coal prior to its complete combustion. The late Sir William Siemens showed them long ago how to convert coal completely into gas by means of his great "producer" furnaces, and demonstrated the applicability of the comparatively poor "producer" gas to operations requiring very high temperatures, as well as to the minor work of steam-raising. Siemens showed that when so used, 1 ton of coal could perform as much work as 1.7 tons burned in the solid form. In such comparisons the producer gas was, of course, burned at a short distance from its source and under the regenerative system. That mode of using coal seemed to be the most economical of which they had had practical experience, but the gas which it produced contained a large proportion of useless nitrogen, and therefore was not rich enough in combustible matter for general distribution.

The Wilson method of gasifying coal and that employed by the Leeds Forge permitted the production of a richer gas. The Wilson process involved the formation of a certain proportion of "producer" gas in raising the temperature of the coal up to the point at which it could decompose steam, and then produced a mixture of carbon moooxide and hydrogen, or so-called "water gas." The former could be used for steam-raising or furnace work in the immediate vicinity of the producer, while the water gas could be transmitted through mains as readily as ordioary town gas, and lost nothing by carriage save its initial heat. Thus one general method afforded two qualities of fuel and gasified the coal in a very economical manner. By the Siemens' method in its modero form, or by the more or less complete conversion into rich water gas, a great saving in coal could now be secured in almost all large operations requiring the command of high temperatures, and the use of such gaseous fuel was so steadily extending that they might expect in the near future to reach the maximum practicable economy of coal in their greater industries and of smoke-abatement as well. Between the complete conversion of coal into gas and the very partial process included in the production of ordinary illuminating gas was a wide gap which needed to be bridged over in the interests of small manufacturers and the domestic consumer alike before they could secure that economy in the use of coal which they knew to be necessary. The true solution involved a compromise much on the lines along which gas-managers were at present apparently working. They would thus see that the best prospect of solving a considerable part of the smoke-fog difficulty seemed to lie in that direction, and it was in the same direction that they were to look for true economy in the use of coal. Hence their duty to posterity and their own immediate interests coincided in requiring the use of more economical methods of using coal, and that which gave promise of the greatest number of advantages involved the conversion of coal, as far as possible, into gaseous fuel.

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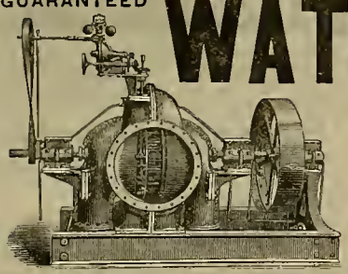

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Useful Information.

Lightning and Thunder.

Three kinds of lightning have been distinguished by Arago: 1. The zigzag flash or "forked-lightning," of ordinary occurrence. The zigzag form is probably due either to the presence of solid particles in the air or to local electrification at certain points, making the crooked path the one of least resistance. 2. Sheet lightning, in which whole surfaces are lit up at once, is probably only the reflection on the clouds of a flash taking place at some other part of the sky. It is often seen on the horizon at night, reflected from a storm too far away to produce audible thunder, and is then known as "summer-lightning." 3. Globular-lightning, in the form of balls of fire, which move slowly along and then burst with a sudden explosion. This form is very rare, but must be admitted as a real phenomenon, though some of the accounts of it are greatly exaggerated. Similar phenomena on a small scale have been produced (though usually accidentally) with electrical apparatus. Cavallo gives an account of a fire-ball slowly creeping up the brass wire of a large highly-charged Leyden jar, and then exploding as it descended; and Plante has recently observed similar but smaller globular discharges from his "rheostatic machine" charged by powerful secondary batteries.

The sound of the thunder may vary with the conditions of the lightning-spark. The spark heats the air in its path, causing sudden expansion and compression all round, followed by as sudden a rush of air into the partial vacuum thus produced. If the spark be straight and short, the observer will hear but one short, sharp clap. If the path be a long one and not straight, he will hear the successive sounds one after the other, with a characteristic rattle, and the echoes from other clouds will come rolling in long afterward. The lightning-flash itself never lasts more than $\frac{1}{10000}$ of a second.

The damage done by a lightning-flash when it strikes an imperfect conductor appears sometimes as a disruptive mechanical disintegration, as when the masonry of a chimney-stack or church-spire is overthrown, and sometimes as an effect of heat, as when wires and objects of metal in the path of the lightning-current are fused. The remedy against disaster by lightning is to provide an efficient conductor communicating with a conducting stratum in the earth.—Electrical Age.

USES OF RESIN.—There are many useful purposes, says *Engineering*, to which resin can be applied outside of those of general practice. As a nonconductor of heat it is used in the protection of water pipes, particularly in crossing bridges where the pipe is laid in the middle of a long box and the whole filled with melted resin. Resin is also used in supporting basement floors in machine shops, which may be laid over some dry material, as spent molding sand, which is carefully leveled off, and the plank laid upon temporary supports separating it about two inches above the sand. Numerous holes, about two inches diameter, being bored through these planks, melted resin is forced through them by means of funnels until the whole space is solidly filled, and then the upper flooring is laid upon these planks. In case the floor is subjected to shocks sufficient to break the resin, it rapidly joins together again in much the same manner as the regelation of ice. Resin is also used to form waterproof paper for use in butchers' shops, fish markets, and also for building purposes, and, strange to say, this improvement reduces the cost of the paper. All methods of applying resin in solution after the paper is finished add heavily to its cost and also render it very brittle; but if the resin is dissolved in potash and mixed with the pulp in the beating engine and this alkali afterward treated with alum, it becomes neutralized and washed away, leaving the finely diffused resin throughout the whole mass. It is also used for protecting the coarser manufactured products, such as agricultural implements, against rust by mixing it in a solution with benzine. This is applied as varnish, and the benzine rapidly dries away, leaving a coat which protects the material until it goes to the severe service of actual use.

IT seems that peat has been permanently adopted as fuel for locomotives on the Vadstena-Oderhous Railway in Sweden, after a series of exhaustive tests to determine its relative value as compared with coal. In the final tests a locomotive pulled a train at regulation speed, and up the steepest gradients, steam being maintained at full pressure, even with cold water fed into the boiler.

ALUMINUM IN BUILDING.—A new departure in building is to be made in a structure to be erected at the corner of State and Madison streets, Chicago. It will be 16 stories high, with a frontage of 66 8 feet on State and 106 feet on Madison street, the exterior of which is to be of aluminum and glass. Aluminum has been used considerably for inside work of buildings, such as elevators, railings, etc., but never before for outside work, save in a small way, for ornamentation. More than $500,000 will be expended on this building, and it will be a work of art in every way. The first story will be of ordinary height, and the upper ones 12 feet, 10 feet 6 inches and 11 feet in the clear. The windows will occupy the entire distance between the floors, except the small space required for the mullions, and each window will be of two sheets of glass 11 feet long joined at the center by a strip of aluminum, making practically one plate of glass 22 feet long. On each side will be a smaller window for the purpose of ventilation. The mullions between the windows will be covered with a plate of aluminum. On the State-street side will be three and on the Madison-street side four columns of aluminum running from top to bottom of the building, designed in ornate and pleasing forms. The window-frames will be covered with gold leaf, and the interior decorations will be of the most elaborate sort.—Manufacturers' Gazette.

ANOTHER FAVORABLE COMPARISON OF OIL FUEL.—When the interest among the naval and stationary engineers is so continuously directed to the question of utilizing oil as a fuel under boiler furnaces, it is interesting to observe something of the relative economy, under favorable circumstances, of coal and oil. In New Jersey, in competition with anthracite slack and Westmoreland coal, it has been found that if the oil be at 24 cents per gallon, it would compete with coal at $3.95 per ton, at a test of a 6000 horse power boiler plant. With coal at $3.10 per ton, and oil at 2.25 cents per gallon, the coal was cheaper; and where, in the coal district, that fuel could be got at $1.50 per ton and oil at 1.5 cents per gallon, the oil cost one-third more than the coal. The theoretical evaporation of ordinary oil is about 21 pounds of water per pound of oil, and they have been experimentally able to get 16.7 pounds of water per pound of oil 63° B. in New Jersey, and in New England 17.8 pounds of water to steam at 90 pounds per pound of oil. This evaporation is secured by that method by which the oil vaporized to gas in a retort is carried forward to meet warmed air at the burner. A much more efficient combustion is obtainable than when the oil comes as a fluid to the furnace, and many of the difficulties connected with the fouling of the heating surface are avoided.—American Manufacturer.

A SUCCESSFUL experiment in tempering curved armor-plates which have been subjected to the Harvey process was recently made at the Bethlehem works. The plate used weighed 14,000 pounds and was 10½ inches thick. The curvature was about the same as that of the plate used on the turret of the Miantonomah. Ice water was used in tempering, and the contraction was very slight. Borings from the plate were examined at one-eighth of an inch in depth and its solidity was satisfactory. The plate was then suspended in a tank of oil for a while, and afterward removed for examination as to shrinkage.

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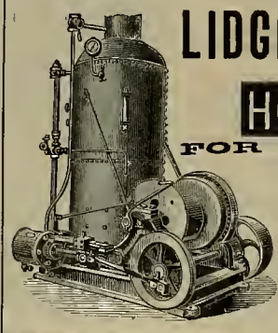
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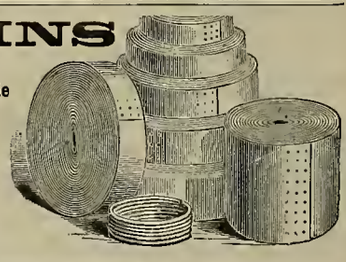

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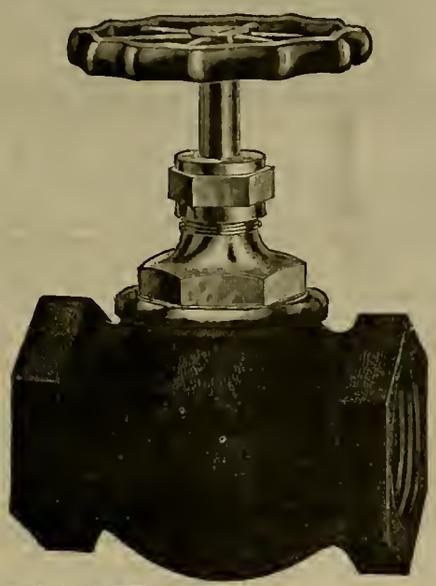

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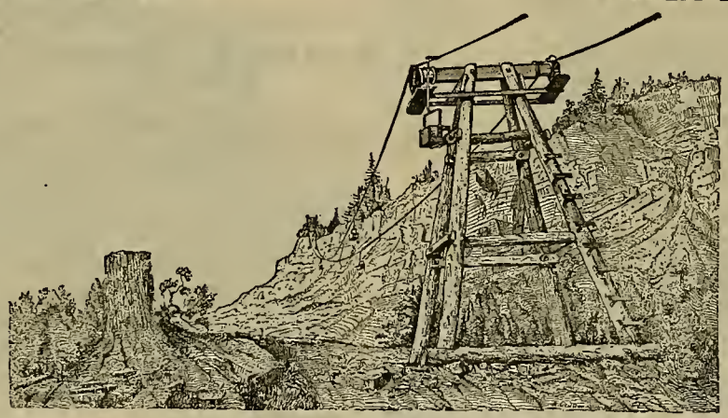

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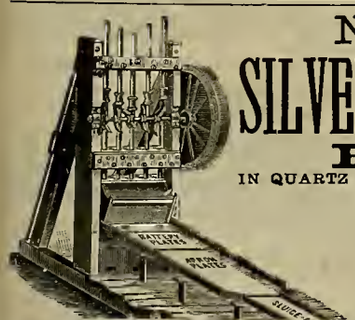

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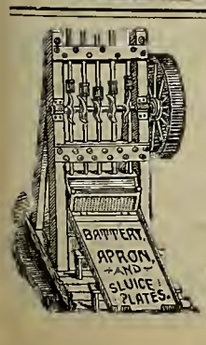

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INCANDESCENT LAMP PATENTS. — The great litigation over incandescent lamp patents was ended on Oct. 4 by a decision of the United States Circuit Court of Appeals, the court of last resort, sustaining the Edison patent No. 223,898, dated Jan. 27, 1880. The opinion, prepared by Judges Lacombe and Shipman, lays stress on the practical results achieved by the invention, and holds that substituting a carbon filament for the platinum wire described in Edison's French patent of 1879 was a patentable improvement. The opinion says: "Edison's invention was practically made when he ascertained the heretofore unknown fact that carbon would stand high temperatures without disintegration, even when very attenuated, if operated in a high vacuum." This decision is the last of three important ones, all of which have sustained the Edison patent. The first was delivered by Justice Bradley, of the United States Supreme Court, at McKeesport, Pa., in 1889 The second was handed down by Judge Wallace, of the United States Circuit Court, a few months ago. The Edison Co. will be entitled to a heavy accounting from manufacturers of incandescent lamps for past profits, but the patent has a little over four years more to run, so the public will not have to pay increased prices for lamps very long if the prices are raised. Another important electric patent case decided on the same day by the same court was that of the Brush Electric Co. vs. The Electric Accumulator Co., in which the plaintiff's patent, No. 337,299, was sustained. The defendants in the case owned the Faure patent, patented Jan. 3, 1882. These two patents were the subject of an interference case in the Patent Office, but the Brush patent was finally granted. The patent thus sustained is a fundamental one. Another patent of the Brush Co., No. 266,090, involved in the same suit, was held by the court to be not infringed.—Engineering News.

STORAGE BATTERY TRACTION IN NEW YORK.—It is now definitely announced that a storage battery system is to be installed in this city on the Second Avenue line by the Waddell-Entz Company. A powerhouse is to be constructed at once and ten cars equipped throughout with Waddell-Entz apparatus are to be placed in active service. The installation will not be radically different from that which has been hitherto employed in such plants. We are glad that the storage battery is to have another fair opportunity to assert its right to a place among the practical systems of street railway traction of to-day. It bas thus far failed to do so, but it is to be operated here in New York under favorable conditions and the result, whatever it may be, will have an important bearing on the future of storage battery traction. It seems rather unfortunate that the attempt should be made on a line which follows the elevated railroad structure where the last objection to its rival, the trolley, is removed, with which, under these conditions, it could hardly compete. Tbat cars equipped with storage batteries can do the required work and do it satisfactorily, cannot be doubted; whether they can do it economically is another question and one whose solution will be looked forward to with interest.—Electrical World.

THE Eastern railroad of France bas been making experiments in the electric lighting of trains by means of primary batteries. The cell used is the Meritens, a modification of Smee's cell. The electrodes consist of a plate of amalgamated zinc and of platinized lead. A gutter at the bottom of the cell is filled with mercury, and serves to maintain the amalgamation of the zinc. The electrolyte is dilute sulphuric acid. Ten elements are enclosed in a water-tight case. The electromotive force of the cells is .9 volts. In lighting, all the cells are not used when the battery is new, but two are kept in reserve, to be brought into use when the resistance at the cells has been increased by the formation of the zinc sulphate. Two batteries of a total weight of 265 pounds are placed under each car, and are found capable of maintaining eight lamps at full power for 48 hours, the cost per lamp-hour being 1.4 cents.

A NOTICEABLE feature of the new power stations in this country is the tendency to the use of larger units in both the electrical and steam equipments. In one of the new central stations to be built in St. Louis, for which the contract has just been closed with one of the largest manufacturing companies, it is announced tbat only three generators of 800-horse power each will be used for tbe operation of 65 cars, eacb of these being equipped with motors aggregating 50-horse power. This installation will also have that other feature which is becoming deservedly more popular in lighting as well as power plants, of coupling the engine and generator direct to the same shaft. Several large lighting plants already embody this metbod of construction, but it has not been introduced to any great extent in railway practice.

NEW USE FOR ALUMINUM.—The variety of new uses which, under the influence of the glut in the aluminum market, caused by the advent of the electric process, has been found for aluminum is very astonishing. We are now told that it has been found that powdered aluminum can be burnt to as good effect as magnesium for lecture-room purposes, while it is considerably cheaper. On the other hand, this aluminum light is not so actinic as magnesium light. The powdered aluminum cannot be satisfactorily burnt in an ordinary spirit lamp, but the best result is obtained by using such a lamp fitted for receiving in the middle of its flame a supply of oxygen, and into which the powdered metal is simultaneously projected by means of a compressible india-rubber ball. The best light was secured by burning in tbis way a mixture of 100 parts of finely-powdered aluminum, 25 parts of lycopodium, and five parts of ammonium nitrate. It has been erroneously stated that this mixture leaves no smoke.—London Electrician.

THE most recent estimate of the capital invested in the electrical industries in the United States is $720,000,000, and of this amount $350,000,000 represents the proportion which electric-lighting and power have attained; $100,000,000 is also the estimated investment in electrical supplies, of which the electric-lighting and railway appliances constitute a large proportion.

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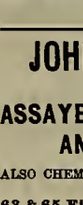

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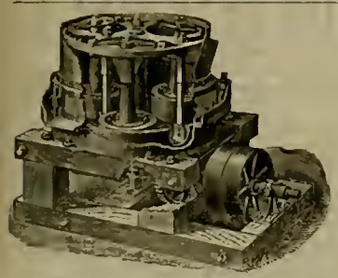

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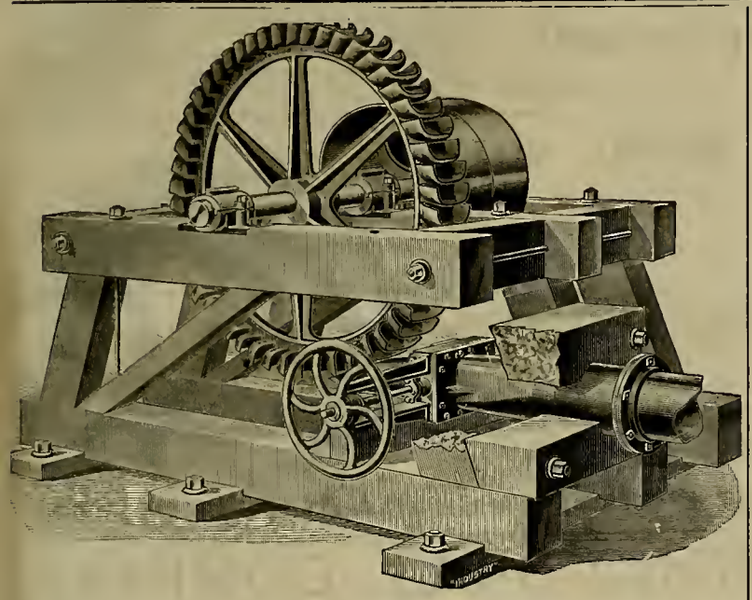

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Made in Lengths Desired from 16 to 30 feet.

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In the manufacture of this Pipe, we use only a high grade of annealed Charcoal Iron of great tensile strength.
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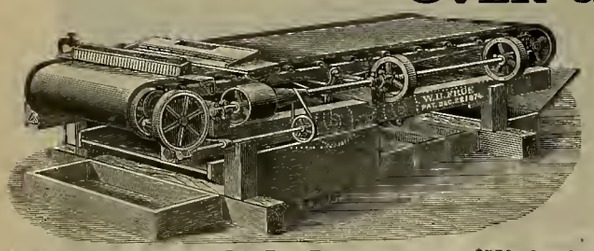
OVER 3200 IN ACTUAL USE.



Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; and March 31, 1891.

GLADSTONE MINING COMPANY, C. J. Clark, M. E. Gen'l. Supt. FRENCH GULCH, Calaveras Co., Cal., Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUS in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small tomention. In order to give an idea of the work they are doing here I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

For any information, or for pamphlets, or for circulars or testimonials, call on or address

Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
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The competitive trials which have been held between the Trinmph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

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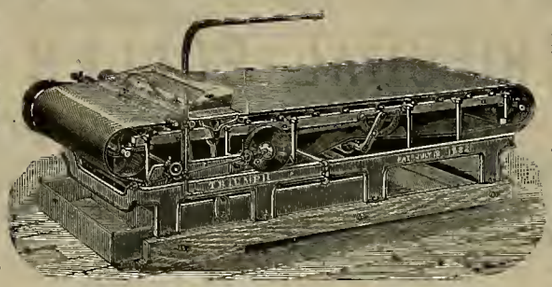
We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



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(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1886.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,

Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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Was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891. MORE THAN DOUBLE THE CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of Best Steel and Wrought Iron. Strong and Durable.

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THE SAN JACINTO ESTATE—Office of the General Manager. CAJALCO, Oct. 30, 1891.

GEO. E. WOODBURY, ESQ.—DEAR SIR: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" Concentrator placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the concentrates equally clean, as from either of the machines at work here

[Copy] Yours faithfully, S. HARRIS, Manager.

THE SAN JACINTO ESTATE, LIMITED—Office of General Representative, P. O address, South Riverside, San Bernardino County.

CAJALCO, February 17th, 1892.

GEO. E. WOODBURY:—Your letter of inquiry about your concentrator came to hand in due course. Your machine is doing well, the motion is all right, and the machine is giving entire satisfaction. Yours faithfully, S. HARRIS.

PATENTED Aug. 19, 1890.

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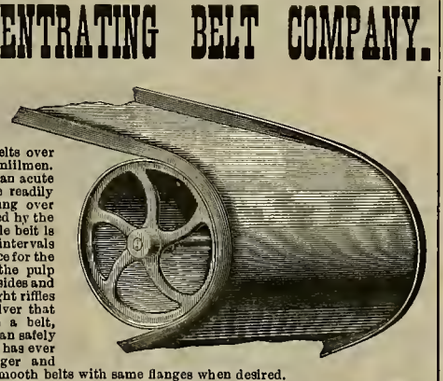
We are now having our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over *any others* will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth. We can safely say that it is a better concentrator belt than has ever been manufactured. It will last much longer and will handle more pulp. We also manufacture smooth belts with same flanges when desired.



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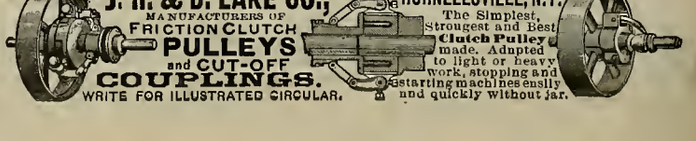

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The Simplest, Strongest and Best Clutch Pulley made. Adapted to light or heavy work, stopping and starting machines easily and quickly without jar.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

CLEANUP.—Amador *Record*, Oct. 27: A cleanup was made last Saturday at the Pacific mill at Plymouth of a crushing of 250 tons of ore from the Bay State mine. The result was very satisfactory, as the yield was 10½ pounds of gold, or a trifle over, $9 per ton. The company is well pleased and feel more confident than ever that they own a valuable property. Dr. Boydston, one of the principal stockholders, was up from San Francisco to see the result of the run, and he was highly pleased therewith. The company has ordered a new pump from Knight & Co., and as soon as it can be gotten in, will resume operations on a more extensive scale than ever in the mine. Plymouth folks generally are highly elated over the prospect at the Bay State.

RUNNING AGAIN.—The Clinton mine at Wieland closed down some time ago, owing to a scarcity of water in their main ditch. One of the county papers had it that the mine was closed down permanently. Such is not the case, for our Wieland correspondent writes that the 30-stamp mill is started up again.

CRUSHING ORE.—A crushing of 110 tons of quartz from the Wheeler & Wild claim in Shenandoah valley is being made at the Cosmopolitan mill. The mine is located three miles northeast from Plymouth, and W. J. and C. W. Wild and N. E. and Arthur Wheeler have it bonded. They have sunk a shaft 30 feet on the vein, and the prospects for opening up a good mine are said to be quite flattering.

A LIVELY DISTRICT.—From all accounts, Pioneer district is having quite a lively mining boom. For several months past, active work has been going on in many newly located quartz claims, while parties have also inaugurated work on a number of mines which have lain idle for some time. They have some good prospects there, and expect to open up at least a few first-class properties.

MILL STARTED UP.—Active operations have been resumed at the Quartz Mountain mine, with John Palmer as superintendent. The mill has started with a Mr. Kyle of San Francisco in charge. Mr. Palmer is a number one, practical man, and it is safe to say that he will manage the affairs of the company to the best possible advantage.

GONE EAST.—W. G. Whorf, the well-known mining superintendent, writes the *Record* from San Francisco that he will take his departure at once for the East to place some mining property, in which he has become interested, on the market. Mr. Whorf is a "rustler," and we hope he will succeed in his undertaking.

SOUTH EUREKA.—At the South Eureka mine they have put in a skip which will raise 750 gallons of water at a trip. A big body of water was struck a few weeks ago, and it was found difficult to handle it, but now it can be controlled readily. Sinking will begin again in a few days.

Butte.

NEW CAPITAL AT BANGOR.—Oroville *Mercury*, Oct. 25: W. G. Hay, of the Hay & Clark mine, Bangor, was in to-day. In addition to their already large mine, they now, in company with ex-Congressman Berry and S. J. Stabler, of San Francisco, have charge of about three miles of the lead extending between the Catskill mine and Kentucky ranch. A company is being formed to work it and Mr. Hay says we may expect a large influx of capital to that section in a short while. All the mines there are paying well, and the outlook grows brighter every day. The Bishop mine is about sold to a company from below, and the owners of it will realize a nice little sum.

Nevada.

POCKET-MINING. — Grass Valley *Telegraph*, Oct. 31: Our local contemporaries have all dropped on the item that two professional pocket-hunters are traveling through the foothills of this county, and are prospecting many heretofore undisturbed quartz ledges. That kind of mining has been going on for years in the region west of Grass Valley. Those pocket-miners pursue their business in a systematic manner, and have certain rules which they follow in order to discover a rich pocket in a quartz ledge. They do not depend on luck or haphazard in finding a pocket, but they observe indications which show them when a pocket is near, and they find it and work it out and say nothing about it. They do not make locations, nor do they work a ledge beyond the pocket. It is a matter of skill and judgment, this thing of being a "pocket miner." Some of these hunters of pockets have made big money and have large bank accounts.

PLACERS.—Nevada *Herald*, Oct. 26: Owners of small placer claims are preparing them for the rainy season, at which time they can be worked. Ravine-mining led to the discovery of some very rich float rock at French Corral last winter, and the discoverers are now waiting for the winter rains to supply them with water and soften the ground. Then they will resume their search for the ledge from which the float rock was detached. If found it will prove a good thing.

SEVEN-THIRTY MINE.—Grass Valley *Union*, Oct. 29: The *Union* is informed by Superintendent Taylor, of the Seven-Thirty mine, that the new hoisting and pumping machine which has been erected on the mine is in complete working order, and that all the water has been pumped out. The shaft is 170 feet in depth, and operations for sinking are to be commenced immediately. It is also the intention to extend the south drift at the depth of 160 feet to strike the pay shoot in the direction of the old Bowery ground, from which quartz was taken when the mine was last operated by lessees who held a short bond on the property. As is well-known there has been a quantity of very rich quartz taken out in that portion of the mine, which indicates the presence of a regular pay shoot. The new plant that has been erected on the mine is of sufficient capacity for development work, which will be carried on systematically. The Seven-Thirty mine is located in the southwest portion of the Grass Valley district, which heretofore has not received the attention that practical miners think it deserves.

THE DELHI DISTRICT.—Nevada *Transcript*, Oct. 27: The quartz-mining region on the Middle Yuba river and Grizzly canyon is tributary to this city, and, as a consequence, when the claims there are doing well a fair share of their output finds its way, by one means or another, into the not unwilling hands of the county-seat denizens. The Delhi, which used to be so productive, but has for awhile until quite recently been treated rather harshly by the fates, is again rising to the top of the waves of prosperity. One thousand feet in from the mouth of the 1500-foot tunnel the company recently sank 30 feet and found a big ledge, the ore of which mills over $30 a ton. Hoisting and pumping machinery is to be put in the tunnel this fall and the shaft will be sunk to a depth of 150 feet, where drifts will be started. At the Enterprise, west of the Delhi, over two years of faithful and expensive prospecting resulted last week in the striking of a large and good ledge. The company had about concluded to "throw up the sponge" when the strike was made. Years ago, in the Live Oak, which is a half mile west of the Enterprise, a tunnel was run and a ledge eight feet thick, or more, was found. Recently a San Jose company bonded the property and taking a crushing from the ledge had it milled at the Delhi with good results. The company has laid in supplies and will thoroughly prospect the property this winter. The St. Gothard shaft, down 400 feet on the ledge, is now being sunk deeper by contract. The tunnel from Grizzly canyon will connect with the shaft at a perpendicular depth of about 300 feet. The mine is looking so well that the stockholders feel confident they will be eventually well repaid for all their outlay of money, as well as for the risk they took in embarking in the venture. The Grizzly Ridge or McAuslan mine, on the Middle Yuba river below the Live Oak, is owned by residents of this city and North Bloomfield. There are two ledges in the location, one a large one of fair grade and the other smaller, but abounding in "specimen" ore. There is now on the dump 40 tons of quartz ready to crush. It shows well in free gold and the miners estimate it will pay from $30 to $40 a ton. This mine gives every sign of proving a big one, and it is being opened in good style.

IMPERIAL PAINT AND COPPER WORKS.—Grass Valley *Union*, Oct. 29: This is the name adopted by the new company which has been incorporated to operate on the Spencerville copper mining property. The company has a vast dump from the former workings of the mine, from which metallic copper can be extracted, estimated at 1500 tons of pure copper and 150,000 tons from which mineral paint can be made. The metallic paint made from the ores when reduced is the best in the market, as chemical analysis has shown. The copper which has been produced is of the finest quality, being 99 per cent of pure copper, and the same was used in the sheathing of the cruiser Charleston, which was built at the Union Iron Works, San Francisco. The paint works heretofore in use in the works were on a small scale, but the new company designs establishing a more extensive plant in order to be able to supply the demand for the paint, as the paint works have not the capacity to meet the orders as fast as received. The main office is now at 304 Kearny St, San Francisco, and the officers are P. Herman, Pres.; P. Roherbacker, Treas.; Louis F. Dunand, Sec'y, all of San Francisco, and Otto Woehler of Spencerville, Supt. Until the organization of the company, Mr. Woehler was the sole owner of the property, and has long experience in the copper mining business, being with the old company for a number of years, and was one of the purchasers of the property when it was disposed of by the company. The new company does not at present contemplate taking ores from the mine, but will confine itself to working the ores that are upon the surface from which metallic copper and mineral paint can be produced. The property is one of the best in Nevada county, and its capacity for copper production is practically unlimited. The mine, at the time of its original location, made many years ago, was known as the "Well lead," the strongest copper-bearing lead ever discovered in the county.

PROSPECTS OF A GOOD MINE.—*Transcript*, Nov. 1: A ledge which averages nearly three feet in thickness has been struck in the South Idaho mine, which is situated near the famous Idaho mine, Grass Valley district. The rock is filled with mineral, and in many pieces free gold can be plainly seen. W. J. Rogers, County Superintendent of Schools, who is one of the owners, informed us yesterday that the ledge continues to improve the farther they work on it. The prospects are that a valuable mine will be developed.

THE PROVIDENCE MILL STARTS.—Last week the *Transcript* gave an interesting description of the recent rich finds of the lower levels of the Providence mine. Yesterday 15 stamps of the mill started up on a splendid-looking quality of ore. The force of workmen at this mine will soon be increased. One of the ledges recently found has enlarged to eight feet within the past day or two.

Plumas.

RICH DEPOSIT.—*Plumas National Bulletin*, Oct. 27: From several sources we learn that See & Jolly have developed a 2-foot ledge of enormously rich ore in their mine at Granite Basin. Its richness is variously estimated, by some as high as $2000 per ton. That country has been attracting attention for some time, and it contains small ledges of extremely rich ore.

Shasta.

LEASES.—Shasta *Courier*, Oct. 28: The Golden Chariot and other mining property, opened up some years ago by Wm. T. Coleman, near Ft. Dingee, a couple of miles from Shasta, has been leased for six months by Wm. H. Chynaweth of this place, who intends to do some work on the property.

IOO.—Mr. E. L. Ballon is pushing to completion his reduction works on South Fork, and ere long the Yount mill is expected to be put in operation, and then we look for our section to boom. W. Dunham has put on some works at the Black Prince mine, and he with his partners—Gillon and Martin—are expecting to take out some very rich ore. Robinson & Son are doing some work on some of their mines. Brown & Lewis have struck some very fine ore on Andrews creek.

Siskiyou.

PLACERS AND NUGGETS.—Yreka *Journal*, Nov. 2: J. M. Patterson and S. M. Morgan were in town last Sunday, and had some fine nuggets from their newly-discovered ledge on Eddy's gulch, Salmon river, near Sawyer's Bar. The sample shown us weighed about 8 ounces, and seemed to be almost solid gold. They took out six pieces from the decomposed croppings of about the same size, with not more than a quarter of an ounce difference in the weight of each nugget. They have sunk down where the rock is more solid, and find it impregnated with gold to the richest extent. They may possibly find the ledge a bonanza of great richness and extensive, at least we hope so. The miners in the various placer and high-gulch districts are busily engaged in preparing for winter work, expecting there will be a good supply of snow on the mountains, with occasional rain, to furnish water for operating the hydraulics and to carry on ground-sluicing with great success. The drift claims worked steadily during the dry months, have also furnished a great amount of rich gravel for sluicing, and the full supply of water in the streams will start the various quartzmills dependent on waterpower.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Enterprise*, Oct. 29: 1100 level—The west crosscut from the main north lateral drift, 315 feet north from the shaft station, has been advanced 28 feet; total length 316 feet; in porphyry and clay, carrying streaks of quartz. 1500 level—From the south drift at point of connection with the old stopes we continue to extract some ore and fillings of average milling value. 1600 level—We have continued prospecting upward from the old sill floor of the old stopes, from which some ore of fair quality is being extracted. 1650 level—Continue to extract some ore from the drift run east from the winze No. 3 (down 73 feet) in working upward from that point. Also some ore from the old stopes at the north end of the California ground. From the crosscut run west from the northwest drift we are running north in the old stopes and extracting some ore. 1750 level—Have continued to extract some milling ore in working upward from the sill floor in east crosscuts Nos. 3 and 5 from the main south drift, and from this point where the upraise from the end of the drift run south from the end of the crosscut run west from the end of the main southwest drift connects with the 9th floor openings. Are extracting ore along the drift which connected this upraise (45 feet up) with the upraise 44 feet east. On the sill floor, at the bottom of this last-mentioned upraise, the south drift has been advanced 23 feet; total length 55 feet; in a quartz formation, carrying a low assay value. In this main southwest drift opposite east crosscut No. 5 a west crosscut has been started and advanced 18 feet in a quartz formation of low assay value. Have continued making repairs to the southwest drift. 1800 level—There has been extracted from all parts of the mine during the week 970 860-2000 tons of ore which was shipped to the Morgan mill, the average value of which, per car samples, was $25.79 per ton. The average assay value of all the ore worked at that mill during the week, 930 tons, was $22.27 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $18,325.76.

OPHIR.—1465 level—From the south drift, 101 feet below the sill floor of the 1465 level, from the Mexican into the Ophir ground, west crosscut No. 2 has been advanced 5 feet; total length, 172 feet; in a very hard porphyry formation. From the south drift opposite west crosscut No. 2 an east crosscut has been started and advanced 12 feet in a quartz formation. Twenty-seven tons of ore have been taken from this drift and raised to the surface, the average assay value of which is $19.25 per ton.

MEXICAN.—On the 1465 level the west crosscut, started from the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 44 feet; total length, 172 feet, continuing in a hard porphyry formation. Have stopped work in this crosscut and resumed work in the north drift, which has been extended 17 feet; total length, 247 feet; formation, porphyry, showing some clay.

ANNEX.—On the 420 level, east crosscut No. 1 north was advanced 11 feet; total length 192 feet; formation porphyry and clay. From end of this east crosscut a north drift has been started and advanced 5 feet.

GOULD & CURRY.—200 level—The northwest drift, started 435 feet from shaft, has been advanced 18 feet; total length 514 feet. West crosscut No. 5 has been extended 16 feet; total length 57 feet; face in porphyry and quartz. On the Sutro tunnel level, the joint north drift with Savage Company has been advanced 20 feet during the week; total length, 630 feet; face in porphyry.

BEST & BELCHER.—900 level—All work on this level during the week has been on repairs in the north drift and in west crosscut No. 2.

HALE & NORCROSS.—1500 level—Have finished repairing the incline station on this level. 1800 level—During the week advanced No. 1 west crosscut 18 feet; total length 93 feet; face in quartz. West crosscut No. 2 on this level was advanced 12 feet; total length 70 feet; face is in nearly all quartz. West crosscut No. 3 was advanced 18 feet; face in quartz and porphyry. The west drift on the 150 level of the old or A-street workings was extended 10 feet; face in porphyry.

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extracted and milled 172 tons of ore at the average value of $17.25 per ton. Have done no work on the 750 level this week. The Zadig drift, Sutro tunnel level, has been extended 12 feet in hard porphyry.

UTAH.—340 level—The north drift from west crosscut No. 2 has been extended 16 feet; total length, 130 feet. This drift continues in porphyry, clay and quartz formation.

CHOLLAR.—We are retimbering and repairing the west drift, 350 level. The east crosscut, 160 feet south of north line, 930 level, is out 178 feet; face in soft clay and porphyry.

WAAN SHAFT.—The joint east crosscut on the north line of Alpha, 1800 level of the Ward shaft, is out 51 feet, face in hard porphyry. The joint Potosi and Bullion west drift, 1800 level, is out 1016 feet; face in porphyry.

NEW YORK.—West crosscut 110 feet north of the shaft, 800 level, is out 51 feet; formation quartz. During the past week we have hoisted 56 carloads of ore from the 650 and 700 levels, which will average about $35 and $40 per ton.

ALPHA.—The joint east crosscut on the north line of Alpha, 1800 level of Ward shaft, is out 51 feet; face in porphyry.

EXCHEQUER.—The joint east crosscut on the north line of Alpha, 1800 level of Ward shaft, is out 51 feet; face in porphyry.

SIERRA NEVADA.—West crosscut No. 2, from Kenosha tunnel, started from north drift, 800 feet in, has been advanced 30 feet; total length 278 feet; face in porphyry and stringers of quart. The intermediate tunnel between the Cedar Hill drift and Kenosha tunnel has been advanced 20 feet; total length 72 feet; face in soft porphyry. The joint Sierra Nevada and Union west drift, 900 level, has been advanced 24 feet; total distance west of shaft 2558 feet; face in porphyry.

UNION SHAFT.—900 level: The joint Union Con. and Sierra Nevada west drift, 900 level, has been advanced 24 feet; total distance west of shaft 2558 feet; face in porphyry.

BULLION.—The west crosscut from north drift, from top of raise from east crosscut, 320 feet south of north line, 1300 level, is out 20 feet; face in porphyry and quartz. The joint southeast drift from the bottom of Potosi winze, 1850 level, is out 178 feet; face in porphyry. The northwest drift from 1800 station, Ward shaft, is out 1016 feet; face in porphyry.

POTOSI.—Extracted and sent to mill the past week 270 500-2000 tons of ore from ths 550, 980, 1150 and 1300 levels. Milled during the week 270 tons. On hand at mill 63 1600-2000 tons. Average battery assay, $20.90. Average car sample assay, $24.82.

SILVER HILL.—Continue taking out ore on the 160, 260 and 490 levels. Have extracted and sent to mill the past week 199 895-2000 tons of ore. Average battery assays, $19.43; average car-sample assays, $22.78.

Kennedy District.

SHIPPING ORE.—*Silver State*, Oct. 29: J. R. Benton is in from Kennedy district with another load of ore from the Imperial mine. After one more trip, a carload of the rock will be shipped to Chamberlain & Co.'s sampling works at Carlin. It will average $150 to the ton, mostly gold. Messrs. Benton and Kennedy, the owners of the mine, have heretofore worked their ore in an arrastre, but the returns were not satisfactory, as it could not be worked to more than one-half its value. They expect to have a mill built in the spring, which will make the Imperial one of the best paying properties on the coast, as there is an unlimited quantity of ore that will not pay to ship, but which can be milled at a handsome profit. The mine has been thoroughly developed by inclines and tunnels, from which all the ore has been taken so far as there has been no stoping done. There are about 300 tons of ore on the dump which will average about $50 per ton. There are now about 15 men working in the district, and there are several prospects which promise to equal the Imperial. All in all, there is no doubt but that Kennedy district has a bright future.

Tuscarora District.

THE OUTLOOK.—*Times-Review*, Oct. 24: Regarding the outlook of this camp, it is not so dark as was anticipated. In a conference held with the Messrs. Coffin a day or two since, Mr. Grayson gave orders to proceed with the erection of the cyanide plant as speedily as possible with a due regard to economy, and to keep a limited force at work in the mines in which he is interested. The Union Mill Company has resumed bullion shipments, and will send to the front to-day about $20,000.

Ferguson District.

STRIKE.—Ferguson *Lode*, Oct. 28: A new strike was made in the crosscut of the April Fool which by far eclipses anything yet found in the mine. On the footwall of the ledge was found a body of ore which assays up in the thousands.

MOVING.—Pioche *Record*, Oct. 30: The exodus from Pioche to Ferguson continues. Nine of our citizens departed for that camp on Monday.

Osceola District.

PLACER WORK.—Cor. Salt Lake *Journal*, Oct. 22: At Osceola everything is more prosperous than any camp I visited, because here we find gold. Tilford is running his dry-wash every day and is making from $5 to $8 to the man, and working under many difficulties, owing to his primitive machinery. Drew, Shellenberger and others are running machines. Skinner,

Breckenridge and others are taking out gold with rockers and no one knows how much they make, but they always pay their bills and work steady year in and year out, which is a good proof that there is precious metal in their rockers, if they are single men. The O. G. Co. has made a big run this year. The Cumberland was run in ore all the way, and ore in the face some 100 feet. This has the best showing of gold ore in quartz in the camp, and is a hot proposition.

SILVER.—Over on the east, at the foot of Mara mountain, we find a true silver belt, large and well-defined, carrying silver and lead. I have taken ore from this country that ran 225 ounces silver and 65 per cent lead. I state this to show that there is high-grade ore here, despite reports to the contrary. Dr. Baker has some five or six claims on this side, veins from three to ten feet wide, lead propositions, and I consider this country a second Fish Springs, if it were properly developed, for I know that here is good ore and very large bodies of it. They are strong and many of them have an iron gangue; in fact, all the outward appearances and surroundings indicate to the practical miner that here is a country that will pay the man or men that will go to work and judiciously open them. There is a large field here for capital, and at the present time I know of no better place where money can be expended at so good advantage, as the natural facilities are excellent.

Tuscarora District.

NAVAJO.—*Times-Review*, Oct. 28: Work for the week has been confined to the stopes above the 350-foot level, which are looking about the same.

BELLE ISLE.—The stope above the 350-foot level is looking about the same, and those above the 250-foot level are without material change.

NORTH BELLE ISLE.—North drift, south 300-foot level, extended 5 feet; vein in the face is about the same. The stopes are yielding as usual.

NEVADA QUEEN.—No. 8 raise has made 30 feet, crosscutting the hanging-wall. Hoisted 18 cars second-class ore, assay value $30 per ton. Worked at Union mill 67 tons of ore, battery assay $256 per ton.

ARIZONA.

BIG BUG.—Arizona *Journal-Miner*. Oct. 27: John S. Jones gives a good report of mining on Big Bug, a district which has come into considerable prominence this year on account of rich strikes made. He says that Frank Wright brought in a bar of gold bullion a few days since, valued at nearly $1200, the result of a short run made by his mill on ore from the Little Jessie mine. Messrs. Wright and Butler, during the existence of their lease on this mine, are reported to have taken out between $28,000 and $30,000, while Mr. Wright, who now owns a lease alone, has as much more in sight. Mr. Jones is sinking a double-compartment shaft on the mine, on which he proposes to erect hoisting-works soon. He is now down to a depth of 50 feet, and the ore taken from the shaft has paid the expense of sinking and timbering the shaft. C. M. Clark, who recently took a lease on the north end of this same claim, has his shaft down between 30 and 40 feet and has struck good shipping ore, although the ore-body is very small at present. Some development work recently done on the Little Eva, a claim owned by Dr. J. N. McCandless, was very encouraging, and the development work will be continued. While the district has had nothing like a boom, it has been growing rapidly, during the past few months, into one of the most prosperous in northern Arizona.

BRITISH COLUMBIA.

ILLECILLEWAET AND FISH CREEK.—Kootenay *Star*, Oct. 29: Development work has been completed on all the claims at Fish Creek. The Elizabeth and Edinburg, adjoining claims, both owned by Mr. Ryckman, M. P., and Walter Scott, have turned out wonderfully rich, as anticipated. On the former a shaft has been sunk, which is down 70 feet, being in good ore on an eight-inch solid vein. At the surface the mineral of this ledge assayed from 175 to 204 ounces per ton; at the bottom of the shaft it goes 300 ounces silver to the ton, showing that the ore becomes richer as it descends. The carbonates carried in the lode are very rich, assaying over 700 ounces. There is a large quantity of galena and carbonates on the dump ready for transport to the smelter. They are driving a tunnel to intersect the lode on the Edinburg, which is in about 50 feet, and they expect to strike the vein within another 15 or 20 feet. At Copper Hill the Silver Bow is panning out exceedingly well, and there are over 45 tons of rich peacock ore now on the dump. This ore carries 50 per cent of copper, $29 in gold and $7 in silver. The lode has been traced for about 500 yards at surface, and the vein runs from two to four feet in thickness. Some fine specimens have been taken from this mine.

MONTANA.

MISSOULA GULCH.—*Inter-Mountain*, Oct. 25: A general mining boom is on over in Missoula gulch. To-day, in the Henry mine, some new silver ore was encountered. The lessees to-day secured a lease on the Great Western from James A. Murray, and started a force to work sinking a perpendicular shaft. The gentlemen in that district are very confident of finding a continuation of the great copper belt over there. Some three months ago Messrs. Blight, Bennett & Co. secured a lease and bond on a mining claim situated south of the Volunteer and adjoining the Great Western, across Missoula gulch. A small hoist was erected, machinery was placed on the ground and sinking was commenced. At a depth of 90 feet the ledge-matter assumed a peculiar color and showed unmistakable evidences of the existence of copper ore in that locality. The shaft is now developed to the 100-foot level, the workmen being engaged in cutting a station. The lessers are confident that they have encountered an extension of the great copper ledge which supplies the Gagnon and other producers, and claim that the ore being taken from the Henry is similar in character to that taken at the same depths from the Mountain Con. and Green Mountain mines. Sinking on the ledge is still in progress and will continue until the 150-foot level is reached. When the work of cutting the station is completed a force of men will be put to work drifting. At present some very fine specimens of silver ore are being obtained. The leasers are confident that a large body of copper will be struck within 50 feet of the 100 level, and all the mining experts who have examined the property agree with them. A few years ago the Volunteer mine, which is north of the Henry, was started up by some enthusiasts who believed that this ledge would be discovered by sinking a 600-foot shaft and crosscutting. The Henry leasers believe that they started in too far north, and that had a similar amount of work been done 2000 feet south of the Volunteer, the ground across the gulch would be to-day dotted with a magnificent hoisting works.

NEW MEXICO.

ALHAMBRA.—Silver City *Enterprise*, Oct. 28: Capt. J. H. Fitzsimmons, superintendent of the Alhambra and Hobson properties, reports the great bonanza on the Alhambra as still holding its own. It is proving to be one of the greatest ore-chutes of native silver ever struck on any mine. Already 14 tons of ore, which shows native silver predominating in every piece, have been extracted ready for shipment and yet no diminution of the ore-body is apparent, but the extent of the ore-chute seems to increase as development progresses. Much of the ore will run from $6000 to $10,000 per ton. The company contemplates the erection of a small adobe smelter at the mine for the purpose of running the richer ore into bars, as the ore is of too high a grade to ship by freight, and express charges curtail the profits. It is expected that the ore will produce 50 per cent of its weight or more in bullion. The Black Hawk mine is being worked steadily under the superintending of Col. Twomey. E. M. Hand, the general manager, is absent in Central America, and his brother, Arthur Hand, a prominent young mining engineer from Montana, exercises a careful supervision during his absence. The hoisting-works from the old shaft are being moved on to the new shaft.

MOOOLLON.—Capt. M. Cooney has developed an enormous body of ore on the Silver Fountain, the vein is 12 feet in width and averages $28 per ton in gold and silver. It is confidently asserted, and on good authority, that the Sheridan mill will soon be started on ore from the Little Fannie. The Peacock mine is being pumped out, and ore extraction will be commenced as soon as the mine is drained.

OREGON.

THE ASHLAND MILL.—Ashland *Tidings*, Oct. 31: The stampmill for the Ashland Mining Co. is being set up in the most solid, substantial manner at the Gilroy-mill building, some of the heaviest timbers ever worked in Ashland being used in the framework. Four big wagonloads of ore reach the big ore-bins in the mill every day now from the mine. Quartz prospectors are still scouring the hills near Ashland.

A CRUSHER.—Grant's Pass *Courier*, Oct. 29: Messrs. Taylor and Ezell are making arrangements to erect a Thorn quartz-crusher at a point on Williams creek convenient to Black Oak, Trio, Terminus and Ezell quartz claims. Doc. Taylor went to Portland last week for the plant, which will cost in the neighborhood of $6000. The crusher will be operated by water-power and will run day and night. The Thorn crusher is capable of crushing ore as low-grade as $2 to the ton at a profit, and there are thousands of tons of rock in sight which assay from $15 to $20. Some 25 men will be employed on the works when the plant is in position, and it will be a big thing for the mining interests in that part of Josephine. The location of the works is about 17 miles from this city, on Farris gulch. A chlorination works will be erected in connection to dispose of the concentrates.

UTAH.

PARK CITY NOTES.—*Record*, Oct. 31: The tunnel on the Little Bell group is now in a distance of some 75 feet and some very promising vein matter is being encountered by the owners in the face of it. The Anchor people make use of the waste water coming from the tunnel to drive a water wheel, which furnishes power enough to run a blower and supply the blacksmith shop with air. Dr. LeCompte and partners will make a 50-ton shipment of concentrates from the Rosscamp & Glenn property in a few days. The concentrator is doing good work. J. P. Kelly and Hugh Kilkenny have a force of men at work on the Spring and Horn Silver claims, situated in Snake Creek district. Jerry Richardson now has two shifts of men at work on his concentrator, just below the Crescent mine, and is turning out about ten tons of first-class ore per day. In his lease—the old works of the Crescent—he has uncovered a five-foot vein of good concentrating ore. A 65-horsepower boiler and a 35-horsepower engine, with all other necessary appurtenances, arrived for the Lucky Bill Mining Company Sunday last. Masons are at work bricking up the new boilers at the Silver King hoisting works and everything is being got in readiness so that when the new hoisting engines arrive there will be no delay in getting them into position for the work. When finished, the works at the King will be classed among the largest in the Territory. The lessees on the Barnicott property have their shaft down a distance of 175 feet and are now crosscutting. They have encountered a very promising looking ledge, from which they have obtained assays running from 10 to 12 ounces silver. The crosscutting they are doing is for the purpose of exploiting the ledge thoroughly.

ORE AND BULLION.—There were shipped from the Ontario mill this week 38 bars of bullion containing 23,462.13 fine ounces silver. Following are the ore shipments from the Mackintosh sampler for the week: Ontario, 427,410 pounds; Daly, 253,190; Anchor, concentrates, 248,690; Mayflower, ore, 90,890; Silver King, 105,540; LeCompte, concentrates, 38,910. Total, 1,154,630 pounds.

LEAD AND SILVER.—Lead, New York, per 100 pounds, $3.90; silver, New York, per ounce, 84⅞ cents.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

AMERICAN SMOKELESS BOILER COMPANY—Capital stock, $1,000,000. Directors—Edward Bosqui, Charles S. Spinney, H. B. Sharps, C. R. Alberger and Green Majors.

CALIFORNIA MILK COMPANY—Capital stock, $10,000. Directors—J. H. Nichols, F. E. Shafer, E. E. Raymond, J. W. Harvey and C. F. Harvey.

CLEAR LAKE MILL AND ICE COMPANY—Capital stock, $25,000. Directors, J. K. Firth, D. C. Lewis, H. D. Rodgers, Oscar Lewis, P. H. Reardon and R. L. Murray.

BANK OF LASSEN (Susanville, Lassen county). Capital stock, $50,000. Directors—C. G. Lunington, F. Hines, J. L. McDermott, D. Knock and J. R. Perkins.

GRAVITY FLUSHER COMPANY—Capital stock, $250,000. Directors—R. A. Rose, G. C. Holbrook, W. S. Weymouth, W. C. Lewis and E. B. Mastick.

SAN PEDRO PLANING MILL COMPANY (Los Angeles county)—Capital stock, $25,000. Directors—L. W. Blinn, Thomas Hughes, R. R. Streets, W. A. Driscoll and G. G. Hughes.

The Mining Bureau Museum.

Among the recent additions to the collection of the California State Mining Bureau are the following:

Gold and silver specimens from South America—J. Z. Davis.

Carbon (anthracite coal) in quartz, Amador county, Cal.

Quartz crystals of peculiar character, from near Calistoga, Napa county, Cal.—B. Tucker.

Cinnabar, Lake county, Cal.—Dr. Channing H. Cook.

Gold quartz, Porto Fino and Montgomery mines, Cherokee, Tuolumne county, Cal.—Dr. F. Drake.

Opalized wood and amygdaloidal basalt, from Sonoma county, Cal.—J. P. Stanley.

Tin ores, crystalized tin, etc., Temescal tin mine, San Bernardino county, Cal.—E. W. Jones.

Galena crystals in fossil oyster shell—J. Z. Davis.

Gold in hematite, Our Flag mine, Calaveras county, Cal.—T. H. McArdle.

Gold quartz, from a number of mines in Siskiyou county, Cal.

Placer gold—R. H. Campbell Company.

Tantalite, Fresno county, Cal.—Edw. Hooper.

Cinnabar and metacinnaharite, Abbott mine, Lake county, Cal.—J. A. Veatch.

Lava specimens from Kileaua, Hawaii—H. C. Adams.

Boleite, Lower Cal.—Compañia del Boleo.

Awaruite, Josephine county, Oregon—J. A. Scott and Judge W. K. Hanna.

Copper ores, suite from the mines of Boleo, Lower Cal.—Compañia del Boleo.

Stibuite, large specimens from Kern county, Cal.—Sumner & Brown.

Placer gold, Canyon creek, Trinity county, Cal.—C. Dannenbrink.

Several varieties of new and interesting rocks from California localities.

Large and fine specimens of fossil corals from San Diego county, Cal.

Auriferous blue gravel showing gold, from the channel east of Yreka, Siskiyou county, Cal.

Two Indian stone mortars, one from 60 feet below the surface, presented by Jas. Blair, and one from 32 feet below the surface, presented by J. P. Odhert.

Ashestos, Iowa Hill, Placer county, Cal.—H. G. Staah.

Opalized wood, Cow creek, Shasta county, Cal.—J. W. Conant.

Series of interesting carboniferous fossils, from near Stillwater, Shasta county, Cal., collected by H. W. Fairbanks.

Irrigation.

The question whether it pays to irrigate our lands has passed beyond the experimental stage, and it is admitted that it is the only system of husbandry that will pay. Mammoth enterprises have been inaugurated to bring water from our mountain streams to the great inland valleys for irrigating large tracts. Until a general system of irrigation has been completed, our vegetable gardens, vineyards, orchards and upland must use the pump for raising water, with either the windmill or the gas or gasoline engine for cheap motor-power. This demand has engaged the attention of our best mechanics and inventors to build a pump that would be durable and effective in raising large quantities of water.

The San Francisco Tool Company has made special effort in this line of mechanism, and their great plant at 55 Stevenson street makes more irrigation pumps than any house on the Pacific coast.

The Torrent Centrifugal pumps are the best known, and in more general use than any centrifugal pump in this State.

Any one who wishes to be enlightened on the subject of irrigating, draining or handling of water for domestic use or for stock will obtain valuable information by sending to the San Francisco Tool Company, 55 Stevenson street, for an illustrated catalogue.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Nov. 3, 1892.

General trade the past week was only fair. The general belief is that the election interferes with the distribution of goods and stocking up. While this may be the case, yet the general situation does not warrant taking such a view. This is shown in merchants' bank accounts. With very few exceptions, merchants are depositing more money than they are withdrawing. Their increased deposits indicate that the spirit of conservatism continues to dominate both here and in the interior. We dare say that never in the history of the State have merchants stood in such a strong financial position, yet this is not accepted favorably, for it indicates a want of confidence. Times are never so lively and prosperity more general than when money is active and merchants borrowers rather than hoarders; and it is the lack of this which evidently is against a generous trade and more activity in all branches of business.

Eastern mail advices report a growing feeling of confidence and an enlarging trade. The various manufacturing industries report continued activity with, in nearly all, orders ahead. This satisfactory condition has not obtained for several years, and is cause for congratulation and augurs well for the future, coming as it does during a presidential and many State elections. The advance in the price of cotton allowed free selling of that product in the southern States, which has made free collections possible in those States. The very heavy cereal crop in 1891 in the central States are being more favorably felt in both trade and finance. The very heavy movements (October 15th, 100,000,000 bushels of wheat, against 85,000,000 at like time in 1891) in cereals at the eight primary markets in the central States are having the effect of vitalizing railroad securities and drawing European operators into the speculative arena. With these securities active and stronger, it is only a question of a short time before other speculative securities and commodities are favorably influenced. Money at the East is quite active, with better rates of interest ruling.

European mail advices report a more active and stronger growing money market with the rates of interest appreciative. This activity has a favorable influence on general trade and speculation. That usually well-informed and reported rather conservative house of A. R. Cbisholm & Co. of New York, writing on the European outlook, says: "Speculation on the Bourse in Paris promises to be very lively this winter. Paris journals at hand dwell on the plans of leading banking-houses (which, differing from our conservative mode of banking, are very speculative in their movements) in converting the stocks of many industrial companies into certificates paying lower dividends, and of negotiating large conversion schemes from Brazil, Austria, Russia and other countries. The Parisian bankers are confident that a renewed speculation will set in on account of the great plethora of idle capital consequent on the Baring liquidation. The Frenchmen are inclined to invest in American industrials, as in case of a liquidation they will have a home market for them, as well as a Paris and London market. The great point in favor of our securities is that London sees they can be returned and drawn against here at home in case of liquidation. The Baring panic caused the sending back to this country of hundreds of millions of securities, and London now finds her piles of stagnant money earning no incomes or interest."

The International Monetary conference continues to absorb attention at home and abroad. Washington advices to October 29th report that it has been definitely decided that the United States delegates to the International Monetary Conference will sail by the steamer City of New York on Wednesday, November 9th. Representative McCreary, of Kentucky, will not be able, on account of urgent business, to go with the party, but he will follow as soon after as possible. The delegates are: Ex-Comptroller H. W. Cannon, president of the Chase National Bank; Senator Wm. B. Allison, of Iowa; Senator John B. Jones, of Nevada; Representative McCreary, of Kentucky; E. Benjamin Andrews, president of Brown University of Providence, R. I., and Edward O. Leech, Director of the Mint. The last named gentleman is ex-officio a delegate. Professor Andrews was appointed a delegate by the president in place of President F. A. Walker, who was compelled to decline the appointment. Before they sail the delegates will go on to Washington for the purpose of consulting with the President, the Secretary of State and the Secretary of the Treasury with regard to their duties and powers before the congress. After reaching Liverpool the party will proceed immediately to Brussels, where the conference will hold its opening session on November 22. The delegates from this country could not probably have been better selected, and will, no doubt, present data for the consideration of

the conference which should have great weight.

The antisilver press of London, headed by the *Economist*, appears to be taking alarm, and thinks the English Government has gone too far toward bimetallism. This fear is evidently heightened by the appointing of a Rothschild as a delegate, for it is well established that this great financial house favors bimetallism. From other sources of information, there can be no doubt but bimetallism has made great strides, not only in England, but also in Germany. The changing opinion in England is reflected by the Right Honorable Arthur J. Balfour, as reported by telegraph, in his speech, Oct. 27th, to Manchester merchants and bankers in support of the resolution that the most effective remedy of the present disastrous fluctuations in the relations of gold and silver would be an international agreement for the unrestricted coinage of both metals. Mr. Balfour said that he believed the stage which had been reached in the monetary troubles, caused by the appreciation of gold currency, was fraught with evils to every class of people in the British Empire. The currency of Great Britain bore no stable relation to the currency of other nations, and constantly was a chronic hindrance in the way of British export trade. The solution of the present difficulties had been given by the bimetallists. This solution was not only practicable, but also adequate. For a great commercial country a sound instrument of exchange was a matter of first necessity. Such an instrument would be found in a bimetallic currency. This instrument might have its imperfections, but it was better than any other yet devised. Mr. Balfour's declaration of his complete surrender to the bimetallists was received with enthusiasm and some surprise.

SILVER—The market held to fairly firm prices up to to-day, when London came through at 38 15-16d. This decline is a source of surprise to many, but to those who watch the movements of the markets at home and abroad it does not occasion any surprise. They appear to see in it the earmarks of the bears who are discounting the probable action of Congress on the present silver, without taking into due consideration the probable action of the Monetary Conference. Our eastern exchanges, and which is concurred in by leading financiers, are discussing the repeal of the present silver bill, and as this is gaining in favor, probably to it is largely due the low and unsatisfactory market for silver. It may be that short sellers will go one step too far and be made to pay for venturing.

MEXICAN DOLLARS—The market has held steady at around 68¼ cts.

QUICKSILVER—Receipts the past week aggregate 541 flasks. There has continued, for the season of the year, a fair home demand. The market has held firm.

LIME—Receipts the past week aggregate 3754 hbls. The market has been only fairly active. The export demand for the Hawaiian Islands has been quiet. The market is quoted at from $1.25 to $1.50 per hbl.

PIG LEAD.—The market has ruled fairly steady. The demand as is usual at this season of the year is slack. Eastern mail advices report a tone market with round parcels for future delivery very weak.

TIN.—Imports the past week aggregate 657 pigs from Australia. The market for pig is quiet, but apparently firm, while for plate it is quiet and rather in buyers favor. New York mail advices report pig as follows: While the consumption is on a quite large scale and sufficient to have some force, prices are still moved about at the will of the leading manipulators. The available supply for this market is figured out as being larger than usual during the latter part of October, but the statistical position is still practically without weight as a guide to values here or in the European markets.

PIG IRON—Imports the past week aggregate 100 tons from Newcastle, England. The local market, while essentially unchanged, appears to have a hardening tendency in sympathy with the East and England. The consumption is about as heretofore reported. *Iron Age*, Oct. 27th, reports the New York market as follows: Under the leadership of the southern furnaces, the market for ordinary foundry and forge pig is firmer, with the chances considerably greater for an advance than for a decline. Some of the large companies have marked prices up an additional 25c, but there is still iron enough to go around at the price established by the first advance.

COPPER—The market has ruled fairly steady throughout the week. Eastern mail advices report a heavy consumption, but there was no scarcity in the supply, which caused a barely steady market.

COAL—Imports the past week aggregate as follows: Newcastle (N. S. W.) 13 002 tons, Grangeworth 2463, Sydney 3048, Newcastle (England) 1483, Hull 265, Tacoma 2100, Baltimore 1808, Bellingham Bay 1500, Departure Bay 5475, Nanaimo 9207, Seattle 1387; total, 41,738 tons. The market is reported strong at essentially unchanged quotations. The yards are reported only moderately stocked. The tonnage on the way from Australia is quite small. Importers before venturing much on future shipments will probably wait until the character of the winter is more fully determined. With favorable crop weather, ships to this port will be low, but if the weather should be unfavorable, then ships will rule higher.

Eastern Metal Markets.

NEW YORK, Oct. 26.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39 1-18	84¾	11 65	3 80	20 50
Friday	39 1-16	84⅞	11 85	3 80	20 50
Saturday	39 1-16	85	11 65	3 80	20 50
Monday	39¼	85¼	11 65	3 80	20 50
Tuesday	39¼	85¼	11 65	3 80	20 60
Wednesday	39¼	85¼	11 65	3 80	20 60

Quicksilver is firm. Lead and tin are barely steady. Copper is quiet but firm. Pig iron is fairly active. Borax is in fair demand at unchanged quotations.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Brunswick Cons G M Co, California	4	25c	Sept 29,	Oct 31, Nov 17	J Stadfeld Jr, 309 Montgomery
Bullion M Co., Nevada	40	25c	Oct 20,	Nov 24, Dec 14	R R Grayson, 331 Pine
Carra M & M Co			Sept 28,	Nov. 8, Dec 23	C C Coleman, 16 Fremont
Commonwealth Cons M Co, Nevada	9	10c	Sept 7,	Oct 13, Nov 9	R R Grayson, 331 Pine
Cons New York M Co, Nevada	9	1c	Nov 7,	Dec 5, Dec 18	C E Elliott, 309 Montgomery
Cons Pacific M Co, California	14	10c	Sept 29,	Nov 5, Nov 30	F E Luty, 330 Pine
Cons St Gothard M Co, California	6	5c	Oct 15,	Nov 17, Dec 7	T Wetzel, 320 Sansome
Crown Point M Co, Nevada	53	25c	Sept 15,	Oct 20 Nov 10	J Newlands, 331 Pine
Derbec Blue Gravel Co, California	10	10c	Sept 14,	Oct 17, Nov 7	T Wetzel 320 Sansome
Eureka Con Drift M Co, California	5	0c	Sept 19,	Oct 21, N v 14	D M Kerr, 330 Pine
Evening Star M Co, California	6	2c	Oct 10,	Nov 10, Nov 19	J J Scoville, 320 Sansome
Exchequer M Co, Nevada	34	10c	Oct 28,	Nov 30, Dec 28	C E Elliott, 309 Montgomery
Golden Fleece Gravel M Co, California	18	83c	Oct 10,	Nov 16, Dec 7	W J Gleason, Phelan Block
Gray Eagle M Co, California	30	6c	Sept 28,	Oct 31, Nov. 21	A W Barrows, 343 California
Inyo Marble Co, California	18	50c	Sept 2,	Oct 22, Dec 1	A F Thane, 137 Montgomery
Jack Rabbit M Co, Nevada	1	5c	Sept 17	Oct 19, Nov 8	T Wetzel, 320 Sansome
Justice M Co, Nevada	54	10c	Oct 14,	Nov 18, Dec 8	R E Kelley, 419 California
Kentuck Cons M Co, Nevada	5	10c	Oct 3,	Nov 8, Nov 23	J W Pew, 310 Pine
Keyes S M Co, Nevada	5	25c	Nov 2,	Dec 6 Dec 27	J H Styre, 328 Montgomery
Mexican M Co, Nevada	46	25c	Oct 13,	Nov 17, Dec 7	C E Elliott, 309 Montgomery
Mono M Co, California	32	25c	Sept 15,	Oct 24, Nov 14	H D Walker, 3 9 Montgomery
North Belle Isle M Co, Nevada	20	10c	Sept 1,	Oct 6, Nov 7	J W Pew, 310 Pine
Occidental Cons M Co, Nevada	11	25c	Oct 25,	Nov 30, Dec 21	A K Durbrow, 309 Montgomery
Overman M Co, Nevada	65	30c	Oct 5,	Nov 10, Nov 30	G D Edwards, 418 California
Savage M Co, Nevada	79	20c	Oct 7,	Nov 9, Nov 29	E B Holmes 319 Montgomery
Teresa M Co, Mexico	9	10c	Oct 25,	Nov 29, Dec 16	K J Willats, 307 Market
White Mountains M Co, California	2	1c	Oct 13,	Nov 22, Dec 12	S K Nichols, 320 Sansome
Yellow Jacket M Co, Nevada	52	25c	Sept 5,	Oct 7, Nov 11	W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Occidental M Co, Nevada	Annual	A K Durbrow, 309 Montgomery	Nov 21
Silver Lck Cons M Co, Nevada	Annual	W Ladd, 531 California	Nov 9

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	5	L Osborne, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzel, 320 Pine	Sept 19
Consolidated Virginia M Co., Nevada	50	A W Haven, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Oct 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

Mining Share Market.

SAN FRANCISCO, Nov. 3, 1892.

There was no characterizing feature, the past week, to the share market. It has acted very much as if the mill rings and share pools were dragging for the last obtainable share, preparatory to an expected demand from outsiders for shares in the near future. This demand, it now looks like, will be instigated by the knowledge that reforms have been, and are being made in working the mines and in milling the ore by which the rings will not get so large a proportion, if any of the bullion produced. The reforms which have already been made, have been done very quietly, and in such a way as not to attract undue attention. Car samples and also pulp assays of ore are now being given by several of the mines, as also are the number of tons raised and the number milled. The monthly statements are being filed more complete, with more details, which admit of a much better understanding by outsiders, of the situation. These reforms the MINING AND SCIENTIFIC PRESS has been contending for in the interest of outside shareholders and also for the good of the mining industry of the coast. While the rings can go a step farther and have the companies own or lease the mills, so there will not be the least occasion for suspicion of collusion, yet the reforms already instituted are calculated to promote a spirit of investment in lieu of that of gambling in the interest of mill rings, as it appears to have been run. Moneyed men, as it now looks, can invest in shares with a seeming assurance that they will get their proportion of bullion produced, owing to the old game of bullion for insiders and assessments for outsiders, seemingly being relegated to the past.

Probably never before was there a more auspicious time for promoting a mining boom on this coast, by instilling new life into mining shares and running the mines listed on the two exchanges in the interest of *all* shareholders. For all of three years the public on this coast, at the East and also abroad has pursued a conservative and money-saving policy, with the result that the large majority has put money away, and with money in hand it is only human nature to make investments when the opportunity is largely in favor of quick turns and good profits, with a fair degree of certainty that even if prices should go down, they stand a reasonable degree of certainty to get more or less of their money back in dividends. Besides the above, it now looks as if the International Monetary Conference will act more favorable to bimetalism, by which the rehabilitation of silver will be assured in the near future, and this very course, if adopted, is calculated to bring about confidence in all countries which will inspire a spirit of speculation and more prosperous times. Already there is a growing feeling of confidence abroad and also at the East, and as this gains in strength, speculative commodities and securities are more in favor, which is creating a hardening in their market value. This is noted from week to week in our "Financial and Market Review" in another column, to which dealers in mining shares can refer.

The market opened this (Thursday) morning inactive, but fairly strong. After regular call prices shaded off under light business. The attendance at the two boards and around the tickers was smaller than ever, which goes to prove that the public is taking but little interest in the market. The impression prevails among those who are usually well-informed that before there is much of an advance prices will have to go still lower, and when they do go some lower shares in the leading mines would be a buy for something "big." While knowing nothing about the manipulations or how low prices will go, yet the market acts as if it is working into a position for a deal.

Reports are current that several assessments will be levied in this month.

News from the Comstock mines is to the effect that they expect (provided the mining share market is in proper shape) to soon strike on the 400-foot level the downward continuation of the rich ore found on the 300-foot level. They will run for the ore on the 500-foot level if they are successful on the 400-foot. This, of course, means time and money. They are running the lateral drift toward Crown Point. Ore sent the last week from the latter mine pulped over $25 per ton. Challenge and Con Imperial Mining Companies report sending ore to the mill, but do not give the quantity or assay value, which is contrary to law. Important prospecting work is under way in Yellow Jacket, but as there is a large force of men at work it looks as if another assessment is to be levied, probably toward the end of this month. The work in Ophir is being closely watched by mining men. They claim that while the work warrants the belief of an important development, yet it can be turned so as to amount to virtually nothing. This they believe is the more likely to be the case, for both Flood and Mackay are away. Con Virginia is working out of debt, as is Potosi. In the middle mines and also in Sierra Nevada active work is said to be under way.

The market closed to-day weak and inactive. There is no doubt that brokers hold very few shares, which forces the conviction that much higher prices will rule before the month is past.

San Francisco Metal and Coal Market.

ANTIMONY.			**STEEL.**		
Per lb	— @	13½	English, lb	— @	18
BORAX.			Canton tool	— @	8½
Refined, in car lots	— @	7½	Sr'k Diam'd tool	8½@	15
Powdered, do	— @	8	Pick & Hammer	8½@	10
Concentrat'd, do	— @	6¾	Machinery	4 @	6
All grades jobbing at advance.			Toe Calk	— @	4½
COPPER.			**TINPLATE.**		
Bolt	22 @	—	B. V. steel grade		
Sheathing	22 @	—	14x20, spot	— @	5 87½
Ingot, jobbing	— @	14½	Charcoal, 14x20	— @	5 87½
Do, wholesale	— @	13½	Do roofing, 14x20	— @	5 87½
Fire Box Sheets	22 @	24	Do, do, 20x28	— @	11 76
IRON.			**PIG TIN.**		
Bar, base	— @	3	Spot @ lb	— @	23
Norway, base	— @	4½	**COAL.**		
PIG IRON.	Spot.		SPOT FROM YARD—PER TON.		
Eglinton @ ton	22 00@	—	Wellington	$8 00	
Glengarnock	23 00@	—	Greta	7 50	
Am. Soft, No. 1	24 00@	—	Nanaimo	6 50	
Oregon Pig	—@	—	Gilman	6 00	
Puget Sound	—@	—	Seattle	6 00	
Clay Lane White	24 00@	—	Coos Bay	5 50	
Langloan	22 00@	—	Cannel	8 50	
Thorncliffe	23 00@	—	Egg, hard	12 00	
Gartsherrie	22 00@	—	Cumberland, in sacks	15 50	
Barrow	22 00@	—	Do, bulk	14 00	
Carnbroe	22 00@	—	Scotch Spline	7 25	
CHROME IRON ORE.			Scotch Splint	7 60	
Per ton	10 00 @	—	Brymbo	7 50	
LEAD.			West Hartley	7 50	
Pig	— @	4½	TO LOAD—PER TON.		
Bar	— @	5½	Australian	6 00@	—
Sheet	— @	7	Liverpool steam	6 25@	—
Pipe	— @	6½	Cardiff	6 50 a	—
SHOT.			Lehigh Lump	15 00@	—
Drop, sizes *smaller* than B, per bag of 25 lbs	$1 85		Cumberland	13 00 a	—
Do do, B and *larger* sizes	2		Egg hard	11 00@	—
Buck, Balls and Chilled	2		West Hartley	7 00@	—
Buck, Balls and Chilled do, per bag of 25 lbs	2 10		**CROKE.**		
QUICKSILVER.			English, to load	$8 00@	9 00
Home trade, per flask	41 60 @42 00		Do, spot, in bulk	— @10	00
For export	35 50 @36 00		Do, in sacks	— @12	00
			Cumberland	9 00@	—

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 12.		WEEK ENDING Oct 18.		WEEK ENDING Oct. 26.		WEEK ENDING Oct 5.	
Alpha	.35	.50	.30	.50	.25	....	.25	.30
Alta	.35	.55	.30	.40	.25	.30	.20	.25
Andes	.70	.80	.50	.70	.40	.65	.40	.60
Belcher	3.10	4.25	3.10	3.95	2.40	2.85	2.20	2.60
Belle Isle	*.15	....	.10	....	.10	....	.05	....
Best & Belcher	2.25	2.45	1.75	2.25	1.25	1.85	1.40	1.70
Bullion	.60	1.05	.70	.90	.50	.70	.40	.60
Bodie Con	.30	.35	.30	.40	.25	.30	.25	....
Bulwer	.30	....	....	.80	....	....	....	....
Commonwealth	.10	....	.05	....	.05	....	.05	....
Con. Va. & Cal	4.00	4.45	3.45	4.05	2.75	3.25	2.85	3.05
Challenge	.90	1.15	.80	1.15	.60	.75	.55	.75
Chollar	.95	1.30	.80	1.10	.60	.90	.60	.80
Confidence	2.15	3.00	2.00	2.60	1.85	1.95	1.80	2.00
Con. Imperial	.05	....	.05	....	.05	....	.05	....
California	.20	.35	.20	.25	.20	.25	.15	.20
Crown Point	1.15	1.60	1.15	*1.40	1.15	1.40	1.25	1.50
Crocker	....	....	.10	....	....	....	....	....
Del Monte	....	....	.05	.10	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.30	.40	.20	.30	.15	.20	.10	.15
Grand Prize	....	....	.10	....	....	....	....	....
Gould & Curry	1.35	1.55	1.15	1.40	.80	1.15	.80	1.10
Hale & Norcross	2.05	2.30	1.50	2.10	1.40	1.70	1.30	1.50
Julia	....	....	....	....	....	....	....	....
Justice	.25	.30	.10	.25	.10	.15	.10	....
Kentuck	.20	.30	.15	.25	.10	.15	.10	....
Lady Wash	.10	.15	.10	.15	.10	....	....	....
Mono	.10	.15	.10	*.30	*.25	.30	.25	....
Mexican	1.85	2.10	1.50	1.85	1.15	1.40	1.25	1.45
Navajo	....	....	....	....	.15	....	....	....
North Belle Isle	*....	....	.10	....	....	....	....	....
Nev. Queen	.10	....	.10	....	....	....	....	....
Occidental	.30	.35	.25	.3	.15	.2	.15	....
Ophir	3.00	3.30	2.65	3.10	2.15	2.75	2.40	2.85
Overman	.70	1.00	.65	.85	.45	.60	.50	.50
Potosi	.95	1.45	1.00	1.20	.85	1.30	.85	1.15
Peerless	.10	.10	.10	.15	....	....	....	....
Peer	.2	....	.30	....	....	....	....	....
Savage	1.30	1.75	1.00	1.30	.75	1.00	.65	.85
S. B. & M	.26	.75	.50	.65	.35	.60	.30	.40
Sierra Nevada	2.00	2.30	1.60	2.05	1.25	1.50	1.10	1.35
Silver Hill	.20	.25	.15	.20	.10	.15	.10	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.55	1.70	1.25	1.55	1.10	1.30	1.10	1.30
Utah	.30	.35	.20	.30	.15	.20	.15	....
Yellow Jacket	*1.10	1.60	1.30	1.50	1.10	1.35	1.00	1.25

*Assessment added.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 25, 1892.

484,871.—WASHING MACHINE—J. H. Bales, Santa Barbara, Cal.

485 084.—EXCAVATOR—H. P. Bennett, Phoenix, A. T.

484,995. — FRUIT-CUTTING MACHINE — John Burns Los Angeles, Cal.

484,779 —SELF-FASTENING RIM FOR JARS, ETC. H. Cone, Alameda, Cal.

484,857.—BICYCLE—A. H. Kempe, Oakland, Cal.

485 085.—FEEDER FOR BALING-PRESSES—Kruse & Shipley, Oswego, Or.

485,108.—CULTIVATOR—W. S. Miller, Milpitas, Cal.

484 815 —CULTIVATOR—Perkins & Cronenberg, Long Beach, Cal.

484,817.—POTATO-DIGGER—A. A. Pratt, Independence, Or.

484,902.—LABEL-HOLDER—E. E. Smith, Palo Alto, Cal.

485 069.—GRINDING-PAN—A. J. Taylor, Silver City, Nev.

485,118.—POTATO-DIGGER—S. N. Washburn, Little Falls, Wash.

The following brief list by telegraph, for Nov. 1, will appear more complete on receipt of mail advices:

Daniel Best, San Leandro, carburetor; James A. Cain, Markham, Cal., box-nailer; Edwin Densmore, Coronado, surgical splint; John Gambetta, Stockton, axle-nut; Myron B Gibson, Ice velocipede; John Hatch, San Francisco, dredging implement; Daniel K. Howe, Prineland Or., fishing fly book; Cornelius W. Huson, Nevada City, Cal., waterwheel; Ernest A. Langford, Grass Valley, Cal., ore-feeder; George Morr, Lafayette, Or., gopher-trap; John Z. Nyquist, Tacoma, Wash., journal box; John B. Pitchford, San Francisco, waterwheel bucket; Thomas E. Pope, Oakland, railway car; Ernest L. Ransome, concrete mixing machine; William M. Rice, Los Angeles, faucet; Phillip T. Taylor, San Francisco, cable railway grip; William A. Fyfson, San Francisco, pipe-making machine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co in the shortest time possible by mail for telegraphic order. American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DESIGN FOR CUFF-BUTTON.—Julius A. Bidwell, Pomona. No. 21,902. Dated Oct. 18, 1892. The design may be said to consist in a circular figure, apparently embossed concentrically upon a second underlying circular figure, the one overlying the other. The dollar sign ($) is represented upon the smaller overlying circular figure.

RANGE-FINDER.—Charles M. Allen, S. F. No. 484,726. Dated Oct. 18, 1892. This apparatus, which the inventor calls a "range-finder," consists of a camera obscura with perspective scales, plotting-chart and trajectory-scale, whereby the distance of points over level or other surfaces may be accurately determined.

COPYING PRESS.— Edgar F. Verrill, S. F. No. 484,748. Dated Oct. 18, 1892. The invention relates to that class of copying presses in which rollers are employed. It consists in the novel arrangement of the rollers, both those for copying and those for feeding, a novel adjustable moistening roller adapted to be thrown into and out of contact with the copying paper at will and the means for operating this roller, a novel water supply roller for acting on the moistening-roller, and other details of construction and arrangement.

TILE.—Robert F. Hunn, Vallejo. No. 484,741. Dated Oct. 18, 1892. The invention relates to the art of covering surfaces with tiles which, owing to their construction and the method of laying them, can be made so thin that the term "veneering" can be properly applied. The object of the invention is to provide a tile which, on account of its construction, can be rapidly and securely laid to cover any surface, such as the outsides of buildings, mantel-pieces and the interior of vestibules, and all surfaces to be covered, said tile being inexpensive and serviceable. The use of these tiles will avoid the labor involved in laying the ordinary thick tiles in mortar or cement.

HARROW AND CULTIVATOR.—T. J. Hubbell, San Bernardino, assignor of one-third to Geo. H. Smith. No. 484,739. Dated Oct. 18, 1892. This implement for preparing and cultivating the ground consists of a hinged-separable-frame with hearing and steering-wheels, adjusting levers, etc. The machine may be used either as a harrow or a cultivator.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST BORAX COMpany. San Francisco, Oct 31, 1892 At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 23) of One Dollar ($1.00) per share was declared, payable THURSDAY, November 10, 1892, at the office of the company, No. 101 Sansome Street, Room 28. Transfer books will close November 6, 1892, at 3 o'clock, P. M.

ALTON H. CLOUGH, Secretary.

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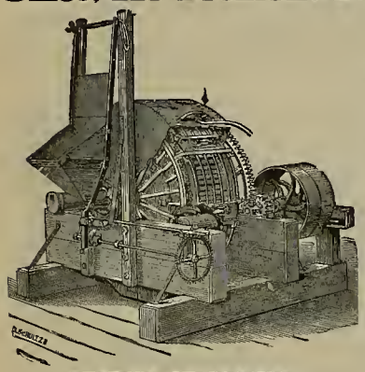

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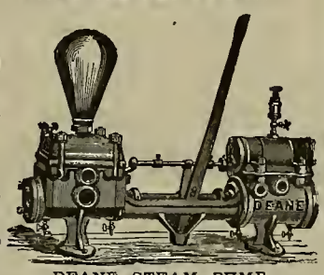

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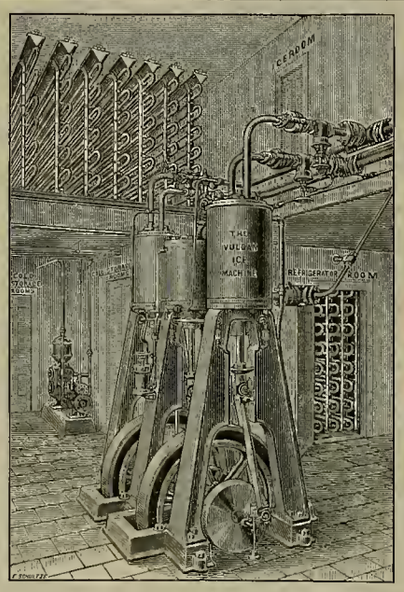

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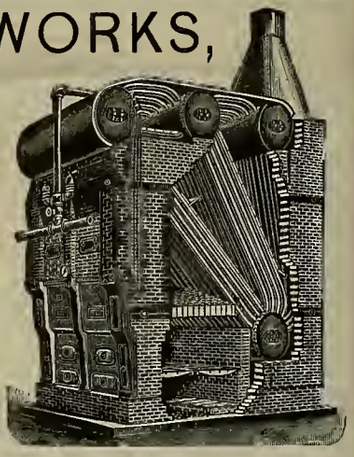

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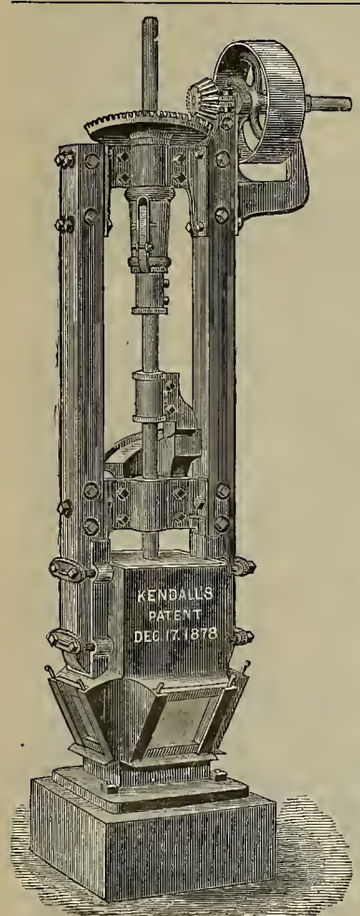

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An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL. LXV.—Number 20.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, NOVEMBER 12, 1892.

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Foundry Notes.

The cruiser Olympia, launched from the shipyards of the Union Iron Works on Saturday last, is the largest war-ship ever built on this coast. The vessel is of the protected cruiser type, exceeding others of her class in size in this country. Of course much still remains to be done on the ship, but she will be finished while in the water alongside the docks. The principal dimensions of the Olympia are: Length on water-line, 340 feet; extreme beam, 53 feet; displacement, 5750 tons; indicated horsepower, 13,500; guaranteed speed on trial, 20 knots; coal capacity, 1300 tons; radius of action at 10 knots, 13,000 miles.

As a matter of comparison, it may be stated that the Charleston's radius of action is only 7477 miles and the San Francisco's 8333 miles.

The Olympia has two masts, with two tops on each. Her sailpower is sufficient to steady her in a seaway. Freeboard forward, 18 feet; aft, 17 feet. Her battery consists of four 8-inch breech-loading rifles, ten 5-inch rapid-firing guns, four 6-pounder rapid-firing guns, eight 1-pounder rapid-firing guns and six torpedo tubes. There are two fixed torpedo tubes, one in the bow and one in the stern, and two training tubes on each broadside. Eighteen-inch Whitehead torpedoes are used. The vessel has a double bottom, and contains about 150 water-tight compartments, besides a number of water-tight doors in bulkheads on the several decks and below the protective deck. A protective belt 2 feet 9 inches wide, filled with cellulose, extends the whole length of the vessel on both sides just above the protective deck. This cellulose is manufactured from the fiber of the cocoanut and when compressed makes a perfect water-excluding material. A passage separates this belt from the coal bunkers, which form another means of protection, particularly to the engines and boilers.

This last vessel built by the Union Iron Works will cost when completed $1,800,000. There are several novel features in the design and equipment. The requirements of speed and engine trial will doubtless be met satisfactorily, as the best work possible has been done by the builders.

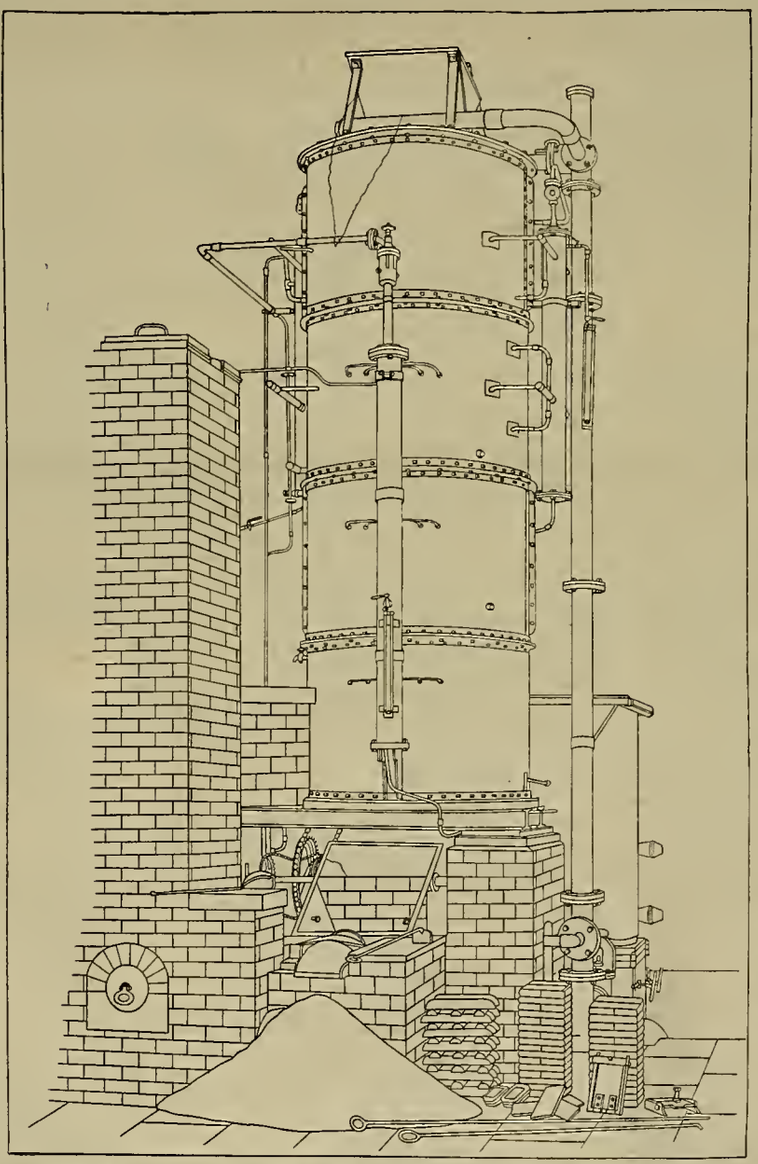
The Atlas Iron Works, at the Potrero, were almost entirely destroyed by fire on Monday. The machine-shop and pattern-shop, with a number of valuable patterns, were consumed, but the axle works, in a separate building, escaped, as did the foundry in the rear. The loss is between $50,000 and $60,000, with $40,000 insurance. The works will be rebuilt at once. The Atlas Iron Works were formerly owned by J. B. Jardine, who moved them to the Potrero about three years ago. Some months since, he was bought out by a company, of which P. Noble is president and J. T. McCrossan is secretary.

MORE miners are going into Ferguson district, Lincoln county, than the times justify, and the *Lode* advises those seeking employment to stay away for the present.

THE Needles Reduction Co. has let a contract to Michigan men to put up smelters valued at $100,000. The plant is to have a capacity of 200 tons a day, and the pyritic process of smelting will be the treatment employed. The contract calls for the completion by March 1st. The works will be built on the Colorado river and on the line of the Atlantic & Pacific railroad.

C. P. HUNTINGTON, president of the Southern Pacific Co. has purchased the Iron Mountain mine near Durango, Mexico. This is a very famous deposit and it is Mr. Huntington's intention to thoroughly open and utilize it. The mountain was owned by a syndicate of Scotch, English and French capitalists, and has been worked in a desultory way or centuries.

MANY Americans are investing in the mines of West Kootenay, B. C., especially in Lardeau and Fish Creek districts.



SHEDLOCK'S APPARATUS FOR THE TREATMENT OF REFRACTORY ORES.

Shedlock's Process for Refractory Ores.

In treating ore by this process, the rock is crushed in the usual way, either by rolls or stamps, the crushed ore being conveyed into an apparatus where each atom is subjected to the action of gases under pressure, whereby the whole of the sulphur and other materials which render the ore refractory are separated. The ore is then conveyed into a vessel containing an absorbing fluid metal, so constructed that every particle of the ore is brought into contact with the metal. For the production of the reducing gases steam and air are passed through highly-heated materials having an affinity for oxygen, and the gases so produced are utilized for raising the ore to a high temperature. By this means the sulphur and other metalloids and base metals are volatilized and eliminated, and the gold in the ore is then in such a condition as to alloy itself or become amalgated with the fluid metal with which it is brought into close contact; the tailings, passing off worthless, are conveyed to the dump.

The apparatus by means of which this process is conducted will be found illustrated herewith. The apparatus in the background is that in which the steam is generated, and which, in combination with the due proportion of atmospheric air, is first superheated in passing through the hearth or bed on which the fire is supported. The superheated steam and air under pressure are then forced through the fire, which is automatically maintained at a considerable depth, by which means the products of combustion are mainly hydrogen and carbonic oxide. These gases are then conveyed by means of the main and branch pipes to the cylindrical apparatus in the foreground, into which the ore to be acted upon is driven under pressure by means of the gases, which, being ignited, raise the ore to a high temperature. The ore is maintained in a state of violent agitation; each particle, being kept separate from its fellows, is consequently very rapidly acted upon by the gases. The ore freed from its refractory constituents is then fed into a vessel containing the fluid metal, in which each particle of ore is separated from the others, and, being acted upon by the fluid metal, is absorbed into it, the tailings and refuse passing off, freed from any gold which may have been in the ore. Quantities of refractory ores treated by this process are said to have demonstrated that most of the gold in the ore is extracted. The successful outcome of these trials is stated to have resulted in the Anglo-French Exploration Company acquiring the right to work the process on the various goldfields of South Africa.

It will have been seen that the peculiar and essential features of the invention consist in subjecting every particle of the ore under treatment to the process in all its stages instead of in bulk, thereby insuring that no portion shall escape being acted upon by the gases and the absorbing metal. This is done automatically and in a very rapid manner. It is stated that this method of treatment is applicable to all ores.

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ALFRED HOLMAN.....MANAGER

Entered at the S. F. Postoffice as Second-Class Mail Matter.

Our latest forms go to press on Thursday evening.

San Francisco, November 12, 1892.

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Comment.

The annual convention of the State Miners' Association will take place in this city on Tuesday next, probably at Pioneer Hall. The different county miners' associations are entitled to one delegate for each ten members, and 400 or 500 representative mining men are expected. The largest delegation will be from the Nevada County Miners' Association, which has a membership of upward of 1200. It is not expected that there will be as many present as on the occasion of the first miners' convention in January last when the State Association was organized. This year counties having no miners' associations have been invited to send ten representatives, but those at a great distance will not be apt to send so many. On the former occasion, Pioneer Hall was found to be not large enough and the convention adjourned to Metropolitan Temple, but the county proportion of delegates is smaller this year.

The convention of this month will not be so easy to "handle" as that which organized the miner's movement. At that time no one knew exactly what was to be done and as soon as anything was proposed it went through. On this occasion the status of the miners is better understood and there is apt to be more difference of opinion as to what will be best for the mining industry. This will lead to more debate and raise discussion of the resolutions, etc., offered. At the different meetings in the county associations, many questions have been debated which may come up before the convention, and the members have opinions of their own which they will now offer.

The principal matters to be discussed by the hydraulic miners at the convention will be the recent decisions of Judge Gilbert relative to impounding dams and the Caminetti bill with the proposed amendments of Senator Felton. This bill, with proposed amendments, is published in full in this number of the PRESS, and should be read carefully by all the delegates so that they may have a thorough understanding of it. The practical ideas of the miners of the convention should be so expressed as to aid the legislators who have the measure in hand. Doubtless a committee will be appointed to consider the details of the bill. Possibly some of the amendments proposed by Senator Felton may not suit the ideas of the miners themselves. At all events, a thorough discussion of the measure should bring out ideas of value. As the House has already passed the bill, and it will be considered by the Senate next month, the opinions of the miners most interested should be expressed, more particularly as to the proposed amendments.

At the first convention almost the entire time of the delegates was absorbed in the hydraulic-mining question, that being considered of most importance. Great good was accomplished for that interest and the attention of Congress called to it, resulting, finally, in the passage by the House of the bill pending in the Senate. Public attention, too, was aroused to the bad condition of this branch of the gold-mining industry of the State, and a distinctly friendly feeling for the miners became manifest. The quartz and drift miners, however, had some little matters affecting them, but which there was no time to consider. As these miners are much more numerous than those engaged in hydraulicking, they will be apt this time to demand more attention. This can properly be given, since the hydraulic-mining question is now in a fair way of settlement, and that industry, by reason of recent decisions, is on a better basis than for ten years past.

Practically putting the burden of proof upon the mineral claimant, in contests between agricultural and mineral claimants before the Land Offices, and permitting agricultural claimants to take up land notoriously mineral in character, are two abuses needing reform. By the latter system, vast tracts of land have been alienated from the mineral domain and lost to the prospector forever. The Government never intended this, and it is an abuse which has grown up under "regulations" of the Land Office, to which the attention of Congress should be called. Requiring a "paying" mine to be found before a title can be obtained, is another evil, for in many cases a claim must be worked several years before it can be made to pay. Then there is the vexed question of mineral on railroad grants, which is bound to come before this convention, although it was ignored by the last one. The subject was brought before one of the committees, but was pocketed for fear of discussion. It is a live question, however, and one which should be ventilated. The railroad companies in this and other States have illegally absorbed large tracts of land, compelling the prospector to buy from them instead of the Government. This is another thing never intended by Congress, and is an evil demanding an immediate remedy. It is even late now, for the mineral land which has already passed to the railroads can scarcely be regained by the public. This is another feature restricting the domain of the prospector and injuring the mining industry of the country.

As to drift-mining—a peculiar branch of gold-mining incident to the geological features of California—those engaged in it are subjected to unusual hardships by the stupidity and ignorance of the Department of the Government charged with granting title to mineral lands. The rulings of this department with regard to drift-mining are absurd in the extreme, but they stand as law—Department-made laws—until the courts or Congress set them aside. Under these rulings, they must, before obtaining patent to the ground, prove the existence of paying mineral, which is under the lava cap, buried hundreds of feet. Tunnels thousands of feet long have to be run to reach the channels, yet the departments require the gold to be found before conveying title. Of course men do not care to expend money on property not their own. These features have been explained time and again, but the department still maintains its position. The drift miners want Congress to officially recognize drift-mining by proper legislation which will give them title to their ground before they begin to spend money on it.

These and other questions will be considered by the miners' convention. They are all of importance to the mining industry. We shall next week give a full report of the proceedings of the convention, so that miners throughout the State who cannot attend may learn of the proceedings.

Water-Power for Mining in Nevada County.

The prices charged for water for power at the mines of Grass Valley and Nevada City are not quite so high as stated by our correspondent in his letter last week. The water rates of the South Yuba Water Co. for power to the quartz mines is, we are informed by the superintendent of the Nevada Division, 18 cents per miners' inch for 24 hours.

In the case of the Idaho mine, water is used under 550-feet pressure, which gives 1.33 horsepower per inch of water, making the cost 14 cents per day for each horsepower. The Empire and North Star mines both use the same water, it being first used at the first mine and then at the second, under a combined pressure of 690 feet, which gives 1.67 horsepower per inch of water and makes the cost less than 11 cents per horsepower for each day of 24 hours. Other mines use water under pressures of 300 to 400 feet, making cost of power range from 18 to 24 cents per day for each horsepower.

There is only one dividend-paying mine at the present time in that vicinity using steampower, which is the W. Y. C. D. of Grass Valley, and which costs them 46 cents per day for each horsepower.

The South Yuba Water Company's canal system was constructed many years ago to furnish water for hydraulic mining for that section of Nevada county situated between the South Yuba river and Bear river. After injunctions had been issued by the courts stopping hydraulic mining, the canals were extended for the purpose of furnishing power for quartz mining in the vicinity of Nevada City and Grass Valley. Up to that time the quartz mines were all run by steampower, which cost from 50 to 75 cents for 24 hours for horsepower.

Mining in the vicinity of Grass Valley received a new impetus, and this section of country entered on an era of prosperity unequaled in its history before, owing to the cheapness and efficiency of waterpower in place of steam.

The South Yuba Company's main canal heads on the South Yuba river near Emigrant Gap, the river furnishing natural water for six months in the year, to the full capacity of the canal of 7500 inches. For the remaining portion of the year the supply of water is kept up from storage reservoirs in the mountains. The main canal conveys the water to the head of Deer creek, where it is dumped, and taken out by canals lower down, and conveyed to the vicinity of Nevada City and Grass Valley. This creek, during the winter months, furnishes a large supply of water, and the main supply from the South Yuba river, since the stopping of hydraulic mining, is only used during the summer months.

During the past ten years, since the company has been furnishing power for quartz-mining, the water has been kept continuously running, without material interruption, except during the winter of 1888 and 1889, when five feet of snow fell in Nevada City, the railroads were all blockaded, all business except snow-shoveling came to a standstill, and even provisions were scarce in Nevada City and Grass Valley.

The company have at different points distributing reservoirs, holding several days' water, which permit the canals to be kept in order and repairs made. Nearly three years ago the company purchased the Birdsall system of canals in Placer county and have kept the same fully supplied with water, the storage system in the mountains being ample to supply both the Nevada and Placer county canals.

In addition they are just completing a new stone dam 67 feet high, near the head of their main canal on the South Yuba river, which will make a reservoir with a holding capacity of 125,000 miners' inches of water. Near Gold Run the company are at work extending their Dutch Flat canal toward Colfax, for the purpose of turning clear water into the Placer county system to take the place of the muddy water now in Bear river, and to supply a section of country now without water facilities.

At different places on the system of canals are falls or drops which can be utilized for power, the water allowed to run on and afterward used over again for power at other places, and finally used for irrigation or domestic purposes. By means of electrical transmission this power will in time be used, and the company are preparing to make use of it as soon as circumstances warrant the expenditure. It is estimated that in this manner they can furnish at different places upward of 50,000 horsepower from its present water-supply, which could be augmented by the construction of additional storage reservoirs in the mountains, the sites of which are now owned by the company.

At the Risdon Iron Works.

The Risdon Iron Works of this city are about to commence the manufacture of a machine for taking care of debris from the working of gravel mines and capable of handling 10,000 yards a day. It first screens out the cobbles and then takes care of the sand, etc., which can be conveyed to any desired place and dumped, by cars or conveyors. The water can be saved and pumped back. They have at the works a working model, made on a scale of one inch to the foot. Those who want to handle gravel without letting the debris run into the streams should examine this model.

These works have also built half a dozen of their cement gravel machines, and a new order has just been filled. This machine breaks up the cement and cleans the cobbles, not crushing them, leaving the free gold in the bottom to be collected without the use of quicksilver.

As stated, the cement is crushed and gold set free, but the cobbles are simply cleaned and not broken. The machines of this type already built are giving satisfaction.

The Risdon shops are also busy on Bryan roller-mills and filling extensive orders for Mexico, part of the machinery being built in sections for transportation on mule-back into the mountains. This mill is meeting with great favor, as it is a very good amalgamator and cheap to transport and erect. Many people believe that the Bryan mill is on some new principle, as it has not been many years on the market. The makers do not claim anything new in the process or mode of operating. It is simply a mechanical improvement on the old Chile mill, which is in itself a development of the original arrastre. The idea is as old as that of stamps for crushing ore. But by improving the details of construction and operation, in accordance with modern mechanical knowledge, a more perfect machine is developed. It is under better control and, what is of great importance, affords greater capacity, doing much more work than the ordinary, crude Chile mill. The Bryan mill has met with much favor wherever it has been introduced, and the sales of the machine are increasing.

THE State Miners' Association will assemble at 10 A. M. Tuesday, Nov. 15th, probably at Pioneer Hall, in Pioneer Building, Fourth street near Market.

Coast Industrial Notes.

GENERAL MANAGER WADE of the Santa Fe brought from Chicago a few days ago the plans for the First street depot in Los Angeles. The plans have been approved by the eastern management. The work of construction will be commenced at once. The new depot will be 300 feet long. The architecture will be of the Elizabethan style and the structure composed of pressed brick, with terra cotta trimmings. The central portion, opposite Second street, will be two stories high, while the two wings, extending on either side, will be one story.

IT is pretty generally known that a party of surveyors has been locating the route for a railroad from Truckee to Tahoe. The line proposed will start from the sawmill of the Truckee Lumber Co., pass through Martis creek, and leaving Richardson's mill to the right, cross the Tahoe divide near the crossing of the present wagon road to Carnelian Springs. There are no serious grades to encounter and the greatest part of the route is through a magnificent belt of pine. The surveyors have completed their work and are well satisfied with the result of their labors. The construction of the road would be a good thing for Truckee.

THE cannery prospects of Alaska are more favorable this year than last. For the past three years the market has been overstocked and 350,000 cases were left unsold at the commencement of this year. As a consequence 36 companies consolidated into 14, of which 9 are in a combine and 5 working separately. The combine restricted their pack this year to 400,000 cases and outsiders cut down to 120 000 cases. The whole 520,000 cases have been disposed of already, together with 75 per cent of the 350,000 left over last year. The balance will soon be disposed of and the canners hope to start next April on a clear market on which they hope to place 700,000 cases of salmon.

THE Olympic Salt Water Company has received its first installment of 25 per cent of the iron pipe which is to furnish sea water for this city from the ocean, and it is now laid out along Post street from the new Olympic Club building to Van Ness avenue. The pipe has been much delayed by a process of painting with paraffine, as the wax had to be imported from the East. The directors of the company expect to have the pipe laid very rapidly now that a start has been made, and hope to be pouring the salt water into the city early next year. The scheme is to establish a large pumping station near the Cliff House and erect engines capable of hoisting 3,000,000 gallons of water every 24 hours to a large reservoir near 43d and Point Lobos avenues, which is nearly 300 feet above the city base level. The pipes will be 12, 14 and 16 inches in diameter, made of cast iron and coated with asphaltum and paraffine. A system of mains and division pipes will be run all over the city, terminating at the foot of Third street, where the water will discharge into the bay. If the water be not used the whole 3,000,000 gallons must pass through the sewers to flush them every day. The water will be used for a large number of baths and tanks all over town.

Personal.

H. G. ADAMS has been engaged by the Flores Mining Co., Arizona, to run its mill.

H. W. HITCHCOCK is now superintendent for the new mining company at White Hills, A. T.

SUPT. W. B. GILLINGHAM of the Phœnix mine, A. T., has made a first-rate strike of rich ore in the mine.

MR. JAMES, of Los Angeles, is superintendent of the Frazer mine, 65 miles north of Ventura, in Ventura county.

CHAS. BALBACH, owner of the Washington mine, Willow creek, Idaho, will change the milling plant from dry to wet.

JOHN LITTLE has disposed of his interest in the Owl and Montana mines near Camphell, A. T., to the Flores Mining Co.

WORK at the Patterson hydraulic mines on Beaver creek, Oregon, was shut down last week for the winter, and Ad Graham and Cliff Payne returned to Ashland.

L. J. LEWIS, of Pentz, Butte county, has moved down to San Francisco for the winter, to recuperate from a hard year's work in opening the Durgin mine.

FRED FRANKS has bonded the Cornell and Deholder mines on White Pine mountain, Nev., it is said, in the interest of Montana capitalists. Messrs. Ross & Siri have also bonded their mine.

E. H. WILTSEE of Grass Valley has recently been examining some quartz properties at the head of Canyon creek, Trinity county. He returned to this city last week, but will shortly leave for the South African goldfields.

MESSRS. Frank Watson, J. C. Pomeroy, W. H. Webb and R. B. Cheeseman went down by land on the 27th ult. to inspect the recent purchase of the Oregon Iron and Steel Company at San Isidro, Lower California, and to plan further operations.

G. W. KIMBLE has charge of the railroad construction for the American River Co. A locomotive for the road has been shipped to Auburn, whence it will be taken to the track. Considerable work has been done on a dam in the river near the chute. About six miles of the road has been graded.

DR. HENRY LEIPMAN, prominently identified with the MacArthur-Forrest process, has arrived in Baker City, Oregon, from New York. Mr. Leipman, it will be remembered, was in Oregon about one year ago, representing the Gold and Silver Extraction, Mining and Milling Company, of Denver, and experimented with the Cyanide treatment at Cracker creek. The gentleman's visit at this time is to take charge of the North Pole Mining Co., which is now putting in a large reduction plant at Cracker creek, Mr. Alexander Baring contemplating a trip to Europe in the near future.

The Caminetti Bill and Proposed Amendments.

The Bill As It Passed the House, and the Amendments To Be Proposed In the Senate by Senator Felton.

[The following hill to create the California Debris Commission and regulate hydraulic mining in this State passed the House at the last session of Congress, went to the Senate, and was referred to the Committee of Mines and Mining of the latter body. Senator Felton inteuds to propose several amendments to the hill as passed hy the House. The copy here printed is the original hill, with the proposed amendments added. These amendments are indicated by SMALL CAP type, while the words printed in *italic* are to be displaced. For instance, in the fourth line of the third section the word *system* is to come out and the word SYSTEMS take its place. Again in the third line of section five the words *canyons and* are to come out altogether, and so on all through the bill. By noting these differences in the type as they occur, one may read the bill as it now stands, or as it will appear if the proposed amendments are adopted.—ED. PRESS.]

IN THE SENATE OF THE UNITED STATES.

JULY 19, 1892.

Read twice and referred to the Committee on Mines and Mining.

AUGUST 5, 1892.

Order to be reprinted with the amendments intended to be proposed by MR. FELTON, viz: Omit the parts in *italic* and insert the parts printed in SMALL CAPS.

An Act

To create the California Debris Commission and regulate hydraulic mining in the State of California.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a commission is hereby created, to be known as the California Debris Commission, consisting of three members. The President of the United States shall, by and with the advice and consent of the Senate, appoint the commission from officers of the Corps of Engineers, United States Army. Vacancies occurring therein shall be filled in like manner. It shall have the authority, and exercise the powers hereinafter set forth, under the supervision of the Chief of Engineers and the direction of the Secretary of War.

SEC. 2. That said commission shall organize within thirty days after its appointment by the selection of such officers as may be required in the performance of its duties, the same to be selected from the members thereof. The members of said commission shall receive no greater compensation than is now allowed by law to each, respectively, as an officer of said Corps of Engineers. It shall also adopt rules and regulations, not inconsistent with law, to govern its deliberations and prescribe the method of procedure under the provisions of this act.

SEC. 3. That the jurisdiction of said commission, in so far as the same affects mining carried on by the hydraulic process, shall extend to all such mining in that territory drained by the Sacramento and San Joaquin river *system* SYSTEMS. Hydraulic mining, as defined in section eight hereof, directly or indirectly injuring the navigability of said river systems carried on in said territory other than as permitted under the provisions of this act is hereby prohibited and declared unlawful.

SEC. 4. That it shall be the duty of said commission to mature and adopt such plan or plans, from examinations and surveys already made and from such additional examinations and surveys as it may deem necessary, as will improve the navigability of all the rivers comprising said systems, deepen their channels, and protect their banks. Such plan or plans shall be matured with a view of making the same effective as against the encroachment of and damage from debris resulting from mining operations, natural erosion, or other causes, with a view of restoring, as near as practicable and the necessities of commerce and navigation demand, the navigability of said rivers to the condition existing in eighteen hundred and sixty, and permitting mining by the hydraulic process, as the term is understood in said State, to be carried *on* PROVIDED THE SAME CAN BE ACCOMPLISHED without injury to the navigability of said rivers or the lands adjacent thereto.

SEC. 5. That it shall further examine, survey, and determine the utility and practicability, for the purposes hereinafter indicated, of storage sites in the *canyons and* tributaries of said rivers and in the respective branches of said tributaries, or in the plains, basins, sloughs, and tule and swamp lands adjacent to or along the course of said rivers, for the storage of debris or water or as settling reservoirs, with the object of using the same by either or all of these methods to aid in the improvement and protection of said navigable rivers by preventing deposits therein of debris resulting from mining operations, natural erosion, or other causes, or for affording relief thereto in flood time and providing sufficient water to maintain scouring force therein in the summer season; and in connection therewith to investigate such hydraulic and other mines as are now or may have been worked by methods intended to restrain the debris and material moved in operating such mines by impounding dams, settling reservoirs, or otherwise, and in general to make such study of and researches in the hydraulic mining industry as science, experience, and engineering skill may suggest as *practical* PRACTICABLE and useful in devising a method or methods whereby such mining may be carried on as aforesaid.

SEC. 6. That the said commission shall from time to time note the conditions of the navigable channels of said river systems, by cross-section surveys or otherwise, *and observe* IN ORDER TO ASCERTAIN the effect *thereon* THEREIN of such hydraulic mining operations as may be permitted by its orders AND SUCH AS ARE CAUSED BY EROSION, NATURAL OR OTHERWISE,

SEC. 7. That said commission shall submit to the Chief of Engineers, for the information of the Secretary of War, on or before the fifteenth day of November of each year, a report of its labors and transactions, with plans for the construction, completion, and preservation of the public works outlined in this act, together with estimates of the cost thereof, stating what amounts can be profitably expended thereon each year. The Secretary of War shall thereupon submit same to Congress on or before the meeting thereof.

SEC. 8. That for the purpose of this act "hydraulic mining" and "mining by the hydraulic process," are hereby declared to have the meaning and application given to said terms in said State.

SEC. 9. That the *owner or owners* INDIVIDUAL PROPRIETOR OR PROPRIETORS, or in the case of a corporation its manager or agent appointed for that purpose, owning mining ground in the territory in the State of California mentioned in section three hereof, which it is desired to work by the hydraulic process, *may* MUST file with said commission a verified petition, setting forth such facts as will comply with LAW AND the rules prescribed by said commission.

SEC. 10. That said petition shall be accompanied by an instrument duly executed and acknowledged, as required by the law of the said State, whereby the owner or owners of such mine or mines surrender to the United States the right and *privileges* PRIVILEGE to regulate by law, as provided in this act, or any law that may hereafter be enacted, or by such rules and regulations as may be prescribed by virtue thereof, the manner and method in which the debris resulting from the working of said mine or mines shall be restrained, and what amount shall be produced therefrom; it being understood that the surrender aforesaid shall not be construed as in any way affecting the right of such owner or owners to operate said mine or mines by any other process or method now in use in said State: PROVIDED, THAT THEY SHALL NOT INTERFERE WITH THE NAVIGABILITY OF THE AFORESAID RIVERS.

SEC. 11. That the owners of several mining claims, situated so as to require a common dumping-ground or dam or other restraining works for the debris issuing therefrom in one or more sites, may file a joint petition setting forth such facts in addition to the requirements of section nine hereof; and where the owner of a hydraulic mine or owners of several such mines have and use common dumping sites for impounding debris or as settling reservoirs, which sites are located below the mine of an applicant not entitled to use same, such fact shall also be stated in said petition. Thereupon the same proceedings shall be had as provided for herein.

SEC. 12. A notice specifying briefly the contents of said petition, and fixing a time previous to which all proofs are to be submitted, shall be published by said commission in some newspaper or newspapers of general circulation in the communities interested in the matter set forth therein. If published in a daily paper, such publication shall continue for at least *five* TEN days; if in a weekly paper, in at least *two* THREE issues of the same. Pending publication thereof, said commission, or a committee thereof, shall examine the mine and premises described in such petition. On or before the time so fixed, all parties interested, either as petitioners or contestants, WHETHER MINERS OR AGRICULTURISTS, may file affidavits, plans and maps in support of their respective claims. Further hearings, upon notice to all parties of record, may be granted by the commission when necessary.

SEC. 13. That in case a majority of the members of said commission, within thirty days after the time so fixed, concur in a decision in favor of the petitioner or petitioners, the said commission shall thereupon make an order directing the methods and specifying in detail the manner in which operations shall proceed in such mine or mines; what restraining or impounding works, if facilities therefor can be found, shall be built and maintained; how and of what material; where to be located; and in general set forth such further requirements and safeguards as will protect the public interests and prevent injury to the said navigable rivers AND THE LANDS ADJACENT THERETO, with such further conditions and limitations as will observe all the provisions of this act in relation to the working thereof and the payment of taxes on the gross proceeds of the same: PROVIDED, That all expense incurred in complying with said order shall be borne by the owner or owners of such mine or mines.

SEC. 14. That such petitioner or petitioners must within reasonable time present plans and specifications of all works required to be built in pursuance of said order for examination, correction, and approval by said commission; and thereupon work may immediately commence thereon under the supervision of said commission or representative thereof attached thereto from said Corps of Engineers, who shall inspect same from time to time. Upon completion thereof, it found in every respect to meet the requirements of said order and said approved plans and specifications, permission shall thereupon be granted to the owner or owners of such mine or mines to commence mining operations, subject to the conditions of said order and the provisions of this act.

SEC. 15. That no permission granted to a mine owner or owners under this act shall take effect, so far as regards the working of a mine, until all impounding dams or other restraining works, if any are prescribed by the order granting such permission, have been completed and until the impounding dams or other restraining works or settling reservoirs provided by said commission have reached such a stage as, in the opinion of said commission, it is safe to use the same: PROVIDED, HOWEVER, That if said commission shall be of the opinion that the restraining and other works ALREADY constructed at the mine or mines shall be sufficient to protect the navigable rivers of said systems and the work of said commission, then the owner or owners of such mine or mines may be permitted to commence operations.

SEC. 16. That in case the joint petion referred to in section eleven hereof is *favorably acted upon* GRANTED, the commission shall fix the respective amounts to be paid by each owner of such mines toward providing and building necessary impounding dams or other restraining works. In the event of a petition being filed after the entry of such order, or in case the impounding dam or dams or other restraining works have already been constructed and *favorably considered* ACCEPTED BY SAID COMMISSION, the commission shall fix such amount as may be reasonable for the privilege of dumping therein, which amount shall be divided between the original owners of such impounding dams or other restraining works in proportion to the amount respectively paid by each party owning same. The expense of maintaining and protecting such joint dam or works shall be divided among mine-owners using THE same in such proportion as the commission shall determine. In all cases where it is practicable, restraining and impounding works are to be provided, constructed, and maintained by mine owners near or below the mine or mines before reaching the main tributaries of said navigable waters.

SEC. 17. That at no time shall any more debris be permitted to be washed away from any hydraulic mine or mines situated on the tributaries of said rivers and the respective branches of each, worked under the provisions of this act, than can be *properly cared for at or below said mine or mines, as per order of said commission, or by the restraining works erected in accordance with the directions of this act by said commission* IMPOUNDED WITHIN THE RESTRAINING WORKS ERECTED.

SEC. 18. That the said commission may at any time, when the condition of the navigable rivers or when the capacities of all impounding or settling facilities erected by mine-owners or such as may be provided by Government authority require same, modify the order granting the privilege to mine by the hydraulic-mining process so as to reduce amount thereof to meet the capacities of the facilities then in use, or if actually required in order to protect the navigable rivers from damage, may revoke same until the further notice of the commission.

SEC. 19. That an intentional violation on the part of a mine owner or owners, company, or corporation, or the agents or employees of either, of the conditions of the order granted pursuant to section thirteen, or such modifications thereof as may have been made by said commission, shall work a forfeiture of the privileges thereby conferred, and upon notice being served by the order of said commission upon such owner or owners, company, or corporation, or agent in charge, work shall immediately cease. Said commission shall take necessary steps to enforce its orders in case of the failure, neglect, or refusal of such owner or owners, company, or corporation, or agents thereof, to comply therewith, or in the event of any person or persons, company, or corporation working by said process in said territory contrary to law.

SEC. 20. That said commission, or a committee therefrom, or officer of said corps assigned to duty under its orders, shall, whenever deemed necessary, visit said territory and all mines operating under the provisions of this act. A report of such examination shall be placed on file.

SEC. 21. That the said commission is hereby granted the right to use any of the public lands of the United States, or any rock, stone, timber, trees, brush, or material thereon or therein, for any of the purposes of this act; and the Secretary of the Interior is hereby authorized and requested, after notice has been filed with the Commissioner of the General Land Office by said commission, setting forth what public lands are required by it under the authority of this section, that such land or lands shall be withdrawn from sale and entry under the laws of the United States.

SEC. 22. That any person or persons who wilfully or maliciously injure, damage, or destroy, or attempt to injure, damage, or destroy, any dam or other work erected under the provisions of this act for restraining, impounding, or settling purposes, or for use in connection therewith, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not to exceed the sum of five thousand dollars

or be imprisoned not to exceed five years, or by both such fine and imprisonment, in the discretion of the court.

SEC. 23. That upon the construction by the said commission of dams or other works for the detention of debris from hydraulic mines and the issuing of the order provided for by this act to any individual, company, or corporation to work any mine or mines by hydraulic process, the individual, company, or corporation operating thereunder working any mine or mines by hydraulic process, the debris from which flows into or is in whole or in part restrained by such dams or other works erected by said commission, shall pay a tax of three per centum on the gross proceeds of his, their, or its mine so worked; which tax of three per centum shall be ascertained and paid in accordance with regulations to be adopted by the Secretary of the Treasury AND THE TREASURER OF THE UNITED STATES IS HEREBY AUTHORIZED TO RECEIVE THE SAME. All sums of money paid into the Treasury under this section shall be set apart and credited to a fund to be known as the "Debris Fund," and shall be expended by said commission under the supervision of the Chief of Engineers and direction of the Secretary of War, in addition to the appropriations made by law in the construction and maintenance of such restraining works and settling reservoirs as may be proper and necessary: PROVIDED, That said commission is hereby authorized to receive and pay into the Treasury from the owner or owners of mines worked by the hydraulic process, to whom permission may have been granted so to work under the provisions thereof, such money advances as may be offered to aid in the construction of such impounding dams, or other restraining works, or settling reservoirs, or sites therefor, as may be deemed necessary by said commission to protect the navigable channels of said river systems, on condition that all moneys so advanced shall be refunded as the said tax is paid into the said debris fund: AND PROVIDED FURTHER, That in no event shall the Government of the United States be held liable to refund same except as directed by this section.

SEC. 24. *That the said commission in order to secure harmony in work to be constructed for reclamation and drainage purposes on said river systems with present plans of river conservation, or with such plans as may hereafter be adopted as provided by this act, having in view their protection from the encroachment of mining debris, or other material, and to promote efficiency and economy is empowered to consult thereon from time to time with a commission of engineers authorized to join such conference by the laws of the State of California. The result of such conferences shall be reported to the Chief of Engineers for transmission to Congress. The consent of the United States, in so far as it is necessary to confer same on account of its reserved control over said navigable rivers, is hereby granted to the State of California, or any municipal or local organization authorized by the laws of said State, to construct such works at its expense: Provided, That whenever the navigable waters of said systems are, or may be, affected thereby, the plans therefor shall be recommended by the commission created by this act and approved by the Chief of Engineers, United States Army.* THAT FOR THE PURPOSE OF SECURING HARMONY OF ACTION AND ECONOMY IN EXPENDITURES IN THE WORK TO BE DONE BY THE UNITED STATES AND THE STATE OF CALIFORNIA, RESPECTIVELY, THE FORMER IN ITS PLANS FOR THE IMPROVEMENT AND PROTECTION OF THE NAVIGABLE STREAMS AND TO PREVENT THE DEPOSITING OF MINING DEBRIS OR OTHER MATERIALS WITHIN THE SAME, AND THE LATTER IN ITS PLANS AUTHORIZED BY LAW FOR RECLAMATION, DRAINAGE, AND PROTECTION OF ITS LANDS, THE SAID COMMISSION IS EMPOWERED TO CONSULT THEREON WITH A COMMISSION OF ENGINEERS OF SAID STATE, IF AUTHORIZED BY SAID STATE FOR SAID PURPOSE, THE RESULT OF SUCH CONFERENCE TO BE REPORTED TO THE CHIEF OF ENGINEERS OF THE UNITED STATES ARMY, AND IF BY HIM APPROVED SHALL BE FOLLOWED BY SAID COMMISSION.

SEC. 25. That said commission, in order that such material as is now or may hereafter be lodged in the tributaries of the Sacramento and San Joaquin River systems resulting from mining operations, natural erosion, or other causes, shall be prevented from injuring the said navigable rivers or such of the tributaries of either as may be navigable AND THE LAND ADJACENT THERETO, is hereby directed and empowered, when appropriations are made therefor by law, or sufficient money is deposited for that purpose in said debris fund, to build at such points above the head of navigation in said rivers and on the main tributaries thereof, or branches of such tributaries, or at any place adjacent to the same, *or at any point calculated*, in WHICH the judgment of said commission, *to* WILL effect said object (the same to be of such material as will insure safety and permanency), such restraining or impounding dams and settling reservoirs, with such canals, locks, or other works adapted and required to complete same. The recommendations contained in Executive Document Numbered Two hundred and sixty-seven, Fifty-first Congress, second session, and Executive Document Numbered Ninety-eight, Forty-seventh Congress, First session, so far as they *referred* REFER to impounding dams, or other restraining works, are hereby adopted, and the same are directed to be made the basis of operations. The sum of fifteen thousand dollars is hereby appropriated, from moneys in the Treasury not otherwise appropriated, to be immediately available to defray the expenses of said commission.

Passed the House of Representatives July 18, 1892.

Attest: JAMES KERR, *Clerk.*

Notions About Patents.

Especially Those Connected With Metallurgical Processes.

SAN FRANCISCO, Nov. 5, 1892.

TO THE EDITOR:—The patent law insists, as I understand it, on the following conditions among others:

1. The thing oo which a pateot is claimed must be *an invention*, not a mere obvious resource of common or technical knowledge.

2. The applicant must be himself the inventor, and the first inventor, of the device, so far as known, admitting that the device may consist in a new combination of known devices.

3. The invention must be designed to produce a useful result. This is construed to mean that it must not be obviously pernicious to the public.

4. The applicant must offer, for public record, such a complete description of his device, whether a machine or a process, as will eoable any expert in the art to which it most nearly pertains to make and operate it successfully without further invention or discovery.

A discovery cannot be patented, but the application of a discovery to a useful purpose can. An idea or principle cannot be patented nor can a fact.

To illustrate: The discovery, or fact, that metallic gold can be dissolved by solutions of certain cyanides is not patentable; neither is the idea that this fact may be applied in the treatment of ores. It must be clearly shown how the fact may be applied and the idea realized in a practicable way before a patent can properly issue. The examiners, however, do not consider the *economy* of the invention as compared with other means of attaining a similar result. Again, a process of grafting the comma bacillus on the common cahbage, so that the consumers of cold-slaw should be sure to have the cholera, might be new and highly ingenious, but would probably be refused a patent because of its pernicious potentiality, while one for causing a dog's tail to divulge a rosebud on its tip would be granted a patent, because it would be unquestionably "new and nnvel," and, although the utility of such efflorescence of the canine caudal appendage might not be very obvious, it would not be pernicious and might please the dog.

Now, as to the patents on the cyanide process, the first in order because the first in date in this conntry, apparently, is the Simpson patent, which some think the most important. This patent claims what I at least do not want, and does not claim what I do want, that is as to gold, because I have tried it, and I think the same of it as to silver, on chemical grounds, although I have heard of a case in which a silver ore yielded to cyanide and salt while not yielding to simple treatment with cyanide. If I am wrong, and if my error should elicit correction, so much the better. I have my own reasons for doubting the reliability, though not the truthful intent of the statement as to silver ore.

As to the otber patents, as published in the MINING AND SCIENTIFIC PRESS of July 2d last, it may he that, as Daniel O Connell said of English acts of parliament, you could drive a coach and four through them, but a coach and four costs money, and then *you might have a breakdown* unless you have a very good driver.

Such as these patents are, they exist, and they cover ground which we may wish to occupy; possession is said to be equal to nine points in ten; the burden of proof will rest with the party who may undertake to break the patents.

Those who raise the outcry that it has been known for a long time that metallic gold could be dissolved by aqueous potassium cyanide must remember that a fact or a discovery is not an invention. Those who assert that the fact has been applied to the treatment of ore many years ago seem to forget the time and place when and where that application was made—a fatal oblivion which would upset the applecart of their contention with great dispatch. They must show that the substance treated was *ore*, not "sweeps," and that it contained base metal as well as precious metal; also that the solution used contained not more than 0.8 per cent of cyanogen, *v. patent No.* 403,302.

This patent seems to me to be the key to the situation. Without it the others would not amount to much, and the key to *it* consists in the alleged selective affinity of a weak solution, whence, ostensibly, the limitation as to its strength. I do not think selective affioity is the correct term for the observed fact. I do not think the alleged selective affinity exists. In truth, a weak solution, like a strong one, "prefers" several base metals to precious metals, and the proper interpretation of the fact observed by MacArthur is very different from that which he gives it. This, however, would not suffice to invalidate the patent if the practical application of the observed fact, as set forth in the specification, is really better for the purpose than the neglect to apply it. The limitation might seem to imply that stronger solutions *had* been used in lixiviating ores prior to the application for this patent, else why not have made the broad claim for a cyanide solution with an expressed preference for a weak one? A similar inference might be drawn from the Simpson patent, which, instead of claiming a cyanide solution, seems to "whip the devil round the stump," just for the sake of getting a patent, by claiming a mixture. It is remarkable what a very slight exhibition of *invention* suffices to obtain a patent sometimes. Could I get a patent on a little more water in my grog?

Inferences, however, are apt to mislead, and any one who has ever applied for a patent knows how the examiners badger and bully the applicant by means of all sorts of absurd and irrelevant objections, often compelling him to accept less than what he is entitled to as the only alternative to abandoning his claim entirely. It is quite possible that, in this case, the examiners were infloenced by the same sort of irrelevant objections that we hear expressed by the public. Be this as it may, no person can be interfered with for lixiviating any kind of ore with a solution containing two per cent or more of potassium cyanide or an equivalent proportion of sodium, calcium, etc., cyanide. In like manner, the precipitation of the metals by means of zinc is, perhaps, free to all, but not as described in patent No. 418,137.

The patent on the treatment of the ore, in certain cases, with lime or alkali, and then with cyanide, is another instance of the very liberal interpretation of the law by the examiners. The process of lixiviation with cyanide was known to MacArthur at least. The process of treating ore with lime or alkali to decompose base-metal salts was known and had been applied for the very same purpose of saving or protecting the cyanide solution long before, though in connection with amalgamation instead of lixiviation, as set forth, not for the first time, however, by me in the report of the State Mineralogist of California for 1888. The *invention* consists only in the conjunction of the two operations, the production of a useful result hy a new combination of two old devices, namely, neutralization by alkali and lixiviation with cyanide. Russell has a precisely parallel patent on neutralizing an alkaline ore with acid and then lixiviating with hypo. I think such patents are absurd, because it requires only a decent knowledge of his profession for any metallurgist to do such things whenever the occasion may arise. But what I think cuts no figure in the matter; the patent exists and it can only be set aside by a competent court.

Does any reader think that I have "flopped;" that I am defending these patents? Let him think so; hut, I again remark, inferences often mislead. What I think is, that I am telling the plain truth about the matter, for the benefit of whom it may concern, and in the hope of eliciting information pertinent to the subject from others.

There are people who think the patents are invalid, because some who try to work the process do not succeed, the inference being that the specifications are not explicit enough to enable one versed in the art, etc., to work by them. Inference again—but against it is the unquestionable fact that some do succeed; and how many of those who have failed could pass an examination as to their being "versed" in metallurgy? "Thou shalt not kick against the pricks," unless thou art well "heeled."

Finally, I am convinced that ores can be, and soon will be, treated hy means of cyanide solutions without interference with any existing patent. The precipitation by zinc is a mere makeshift, objectionable for reasons that I have touched on before; moreover, I am convinced that it is a chief reason for the use of very weak solutions, and for the *invention* of that "selective affinity." When we have a philosophical method of recovery we shall, I believe, be able to use stronger solutions with convenience; thus two of the patents will be disposed of. There will remain only the treatment with alkali, of which I will say no more just now.

The Mulloy process of precipitation, as described in the *Engineering and Mining Journal* recently, and now under trial in Africa, may result in solving the problem in a very neat way. In it a current is used, not to precipitate the gold directly, but to keep a sheet of mercury constantly and uniformly charged with sodium, and the gold and silver are precipitated by the sodium with regeneration of the solution instead of its deterioration, as in the zinc method. I think, however, that a simpler method will answer equally well, for gold at least. It is not that I have any definite scheme of my own in view, but I rely confidently on the inventive faculty of our people to give us what we require, and on competition tn give it to us at a very low rate of royalty, if any.

C. H. AARON.

Gravel Mining in Placer County.

From Our Traveling Correspondent.

The Forest Hill Divide.

October 15, 1892.

TO THE EDITOR:—The Forest Hill divide has, from the earliest days, been known as one of the richest gravel-mining districts in the State, its estimated yield being no less than $30,000,000. Lying between the north and middle forks of the American river, it reaches 40 miles to the summit of the Sierras. Mining operations have extended for nearly three-fourths of this distance. It represents the most complete and varied system of ancient rivers known on the coast, and has given the best opportunities for scientific investigation in this interesting field of geological study.

To Mr. Ross E. Browne, the eminent engineer, mining men and students are particularly indebted. He was the first to undertake the representation of these old channels and to preserve in permanent form, and in some manner systematize, the facts that the experience of 40 years has revealed. His map was published with the State Mineralogist's Report of 1890. With very few and minor exceptions, save, perhaps, in the case of the Morning Star channel, the developments of two years have further gone to prove the correctness of Mr. Browne's work as to the existence, general direction, continuation, etc., of the various channels. Of course, it is not a "Prospector's Guide," nor was it intended as such. I met, however, a number of meo who decried its value and even declare its publication a serious injury, in that eastern men, interested in mines here and believing to be in or working toward a certain channel, saw on the chart no channel at all, or else, perhaps, saw it going another and entirely different direction. The result was that they became alarmed or disgusted, and forsook the work. This is said to be particularly the case on the Baker divide, to the west of Forest Hill. Whether Mr. Browne is responsible or not, further work there has failed to find the unmapped but expected channel, and mining men are divided to-day as to its exact location or possible existence.

As is generally known, these ancient rivers really consist of three channels—the west and east, or rather the right and the left or upper channels, and the middle or lower and older. The former have afforded the great hydraulic mines and surface placers; the latter has been only approached by drift, and the gravel being cement in character, is valuable only by the milling process. Aside from the Red Point and Hidden Treasure, all the great mines of the present are of this class. The two excepted are io deep but uncemented gravel beds.

It is in the main channel or original Blue lead of the divide that the Paragon, Mayflower, Dardanelles, Gray Eagle and the mines under the town of Forest Hill are situated.

For many years tbe Dardanelles was considered the last point on the downward course of this channel. Below, the channel was not known and was not believed to exist. Six years ago, however, the Gray Eagle Mining Company started in three miles below the Dardanelles and three miles above the point where the Middle Fork of the American river cuts the divide. They have spent $150 000 io experimenting and have shown conclusively within the last two years the existence of the Blue lead at this point. Seven miles more of this ancient river course are thus accounted for and given over for future development.

THE GRAY EAGLE.—As noted this is the most recent enterprise on the divide. The property was first prospected thrnugh a shaft 375 feet deep and a short drift and incline 150 feet more to the bedrock. Thus justified, a tunnel was then run from the western slope in Owl Creek Canyon 2675 feet; an incline 165 feet long on ⅓ pitch brought them to the bottom of the channel, and the old workings and exposed both rims. The tunnel is the working passage. At the top of the old shaft are the old hoisting works, no longer used except the engines, which furnish steam to drive the hoist and the pump below. One ten-inch Hooker handles all the water at present. A north gangway has been driven 300 feet. The breast is carried forward about 60 feet wide and four feet high. The gravel, in places showing a thick sprinkling of free gold on the walls, is generally of a very fair quality and gives indications of improvement with the progress of the work. The mine cannot be said to be fully opened up as yet by any means as the channel was only struck in July, but no anxiety is expressed as to its future. The ten-

stamp steam-mill, completed the latter part of June, is running but ten hours a day for the present. T. G. Durning is superintendent.

ELECTRICITY as a motive power in mine operations seems to be coming rapidly into favor on the divide as in Nevada county. The Gray Eagle is considering the advisability of putting in an electric-power plant. A mile below the mill at the mouth of Owl Creek is an unsurpassed site fnr such an enterprise. The canyon affords a fall of 1300 feet in half a mile and sufficient water is readily available. The divide could then offer a worthy rival to Grass Valley in the matter of cheap power as the surplus force would be in demand by the other mines. Many of them are waiting for the Gray Eagle to act and should nothing be done by the latter they will put in plants themselves, notably the Dardanelles and Paragon.

The property to be greatest benefited by the success of the Gray Eagle in proving the existence of the mammoth channel is probably the Spring Garden, owing to its extent and favorable location. As it is likely to be the next big enterprise, and is considered by many the best property on the divide to-day, an account of it may properly be given here.

THE SPRING GARDEN.—It is a well established fact that the old river-bed claims have the advantage over quartz ledges in that, no matter how rich the latter may be, they are liable at any moment to pinch out and baffle all efforts to trace them farther. The river channel, however, seems more tractable and traceable in spite of its windings, and the oft-vexed question of "extension" is avoided.

Three hundred feet below the Gray Eagle's works is the boundary line of the Spring Garden. The company owning it is incorporated and is represented mainly by San Francisco and eastern capitalists. J. H. Widber, city treasurer of San Francisco, is president; another large holder is ex-Surveyor-General J. W. Shanklin, a well-known mining authority.

The property, comprising 520 acres under mineral patent, was worked early in the mining history of the State. It was noted for the rich gulches leading toward the Middle Fork, and from this slope $500,000 was probably taken out, and from a limited area. These mines were all in the west channel, the gold coming from the high rim In the deep lower channel too much water was met for the machinery of the time to cope with successfully. In 1874, an incline on the rim was run 125 feet, and from the bottom of this a tunnel 400 feet, when the bedrock again pitched and the water drove out the workmeo. They were then, however, in the Blue lead, from the blue cement character of the last gravel extracted, which estimated $12.50 a car. The facilities for working this mine surpass those of any other on the lower portion of the divide, as a tunnel can he run from the Middle Fork side at any depth required, offering natural drainage. Investigation has shown the main channel to extend nearly a mile through the property, the west channel about the same distance, and if an east one be found to exist, as is expected, it will have an extent of at least half a mile. A single tunnel 3000 feet long will drain and open for work the three channels.

THE DARDANELLES.—The Dardanelles is the individual property of Gen. Joe Hamilton of Auburn. Mr. H. F. Calenburg is superintendent. It is developed by a 2400-foot tunnel and a 30° incline 300 feet long on the rim to the bottom of the channel, which was reached early in the present year. The channel was struck here in a series of rapids, and work is going on toward the lower end at present, with a breast of 70 feet. At a distance of 40 feet, a large deposit of rich gravel was met, and for the past three months the mioe has been paying very well. The average of the gravel is $30 a car. Its showing is the most flattering of any on the Divide. It is working, though, to a great disadvantage with the present pumping and hoisting system. By this, the power is transmitted from the mill by an endless cable over a mile in length to the pump and hoist in the mine. Through faulty construction, the mill of ten stamps is only allowed a speed of 38 drops a minute in consequence. However, as soon as the present cable is worn oat, which will be in three or four months, electric-power will be adopted.

THE MAYFLOWER.—The opening of this mine in 1884 created an epoch in the mining history of the divide and lent encouragement and capital to the other operations. After spending half a million in developments, the Mayflower yielded the first week it was opened the sum of $87,000. Since then work has been carried forward 2200 feet south to the company's limits and north a mile from the working tunnel. This tunnel is 4000 feet long and connects with the channel by an upward incline 90 feet long. On this property is also a separate and cross-channel known as the Orono, which has partially cut through the original Mayflower channel. The Orono flows from east to west and crosses the other about 500 feet north of the working tunnel. In this second channel a drift 1300 feet in length has been driven and some very good gravel has been found in the past. Of late the work has been in a series of rapids which offer small encouragement. Breasting is going on in this from 30 to 60 feet in width, and also in the north workings of the original channel. The gravel from both channels at present is of only medium quality. The 20-stamp mill is kept runniog steadily, and about 50 men, a majority of them Chinese, are employed. Oscar Jones has been superintendent since the 1st of Julv.

I will continue my description of the mines of this region in another letter. CHAS. E. TOWNSEND.

THE Mining Bureau is in the receipt of some remarkable specimens of gold quartz from the E. D. M. mine, Fort Jones, Siskiyou county. Tbe specimens have been selected for the World's Fair exhibit of that county, and are wonderfully rich and unique in form. The mine from which they were taken was abandoned many years ago, but recent working has disclosed many rich pockets of ore.

Commercial Status of the Cyanide Process.

LOS ANGELES, CAL., Nov. 1, 1892.

TO THE EDITOR.—Since the "cyanide process" first began to attract the attention of the general mining public, it has been interesting to note the difference of opinion it has elicited. It seems that a certain class of mining men are hard to convince, or at least are very slow to accept the statements made by those who are in a position to furnish authentic information, giving as a reason, that "they are interested parties." For my part, I would rather depend on the statements of "interested parties" who certainly have given the matter careful investigation, than on the opinions of disinterested parties whose bias is apparently caused by a loose screw in their own moral makeup. By inference, their own statements would be unreliable were they "interested;" hence their distrust of others.

It seems to me that the gentlemen composing the Gold and Silver Extraction Mining and Milling Company, would not take hold of the process without first giving it a most exhaustive investigation, much less make extravagant claims knowing they could not be fulfilled. Were they irresponsible parties whose sole aim was to sell local rights, they might, it is true, reap quite a harvest for a short time by representing their process to be a universal panacea for all the ills that the metallurgy of gold and silver is heir to; but note their method of doing business; they claim their process to be adapted to a class of ore which happens to be of very common occurrence. They claim a high per cent of extraction. They claim a reasonable cost. They offer every facility for a thorough investigation to those who contemplate interesting themselves. They look principally to the royalty for their remuneration. Does this show on their part, any lack of confidence, either in the merits of the process or the validity of the patents? Are they not to be credited with at least average business sense?

I am like Mr. Aaron in one respect; I should prefer that metallurgy were not hampered by patents unless I could own them myself; but seriously, are not the people who bring the process into notice entitled to some pecuniary reward, or are they to receive their reward in heaven? That is where Mr. Paul, Mr. Aaron and others that could be mentioned, must look for their reward for their pursuit of truth for truth's sake, and their thankless endeavor to set the world right. If I remember rightly, it was only a short time ago that an anonymous contributor to your paper who would doubtless be honored by being allowed to black Mr. Paul's shoes, designated him as a "crank on processes." I wish the metallurgical machinery of this State had a few more such "cranks."

In view of the many comments on the cost of the process, I will give the details of one of the many experiments made by me for the purpose of determining the actual commercial status of the process under favorable circumstances. All things considered, the results given are the best I have been able to attain. Material operated on was arrastre tailiogs, equivalent to 30 mesh; free gold had all been extracted by amalgamation; average assay value, by very careful sampling was $8.27 per ton; three tons were leached 48 hours with 2400 pounds of four-tenths of one per cent solution; three tons were leached 120 hours with 3000 pounds of two tenths of one per cent solution, in both cases till the tailings assayed but a trace. Assay value of the six toos, $49.62. amount extracted as shown by bullion returns from Selby, $46.75, of which about 75 cents was silver; equivalent to 94.2 per cent extracted, leaving 48 cents per ton, or $2.87 in all, which disappeared during the process. Cyanide used, 7.65 pounds; at 50 cents per pound for 98 per cent, would be about 65 cents worth of cyanide per ton of ore treated. Zinc was used as the precipitating agent, and apparently worked to perfection.

FRANK ALDERMAN GARBUTT.

Shasta County Mines.

Texas Consolidated Mines and Mill.

REDDING, SHASTA CO., Nov. 4, 1892.

TO THE EDITOR:—In a direction 18 degrees east of north, and at a distance of six miles from the Scherer group, lately described in the PRESS, is situated the Texas group of mines. The Sacramento river divides them, showing a slate formation for the entire distance. Mr. R. G. Hart, the enterprising owner is rapidly developing his property; work is now being done in the fourth level, 700 feet below the summit; another level will soon he commenced 200 feet farther down.

On the surface and in the two upper levels the formation is an auriferous slate. This changes, as depth is gained, to a dark talcose slate, richly mineralized in the walls. There are three parallel ledges; the east ledge pitches 65 degrees east; the middle and west ledges have a pitch of 50 degrees east, and there is every indication that they will come together as depth is gained in the workings. The walls are perfect, carrying an unvarying gouge of a slaty nature; the metal is well distributed through the quartz, that is of a ribbony character from wall to wall. The direction of the lode is nine degrees east of north. Cross-sections on all of the ledges show that the ore-shoots commence at the apex of the mountain through which the ledges pass, and these shoots gain in length with the trend of the ledges.

In the fourth level the ore-shoot is almost continuous. This level was commenced in June, 1890, and has been driven for a distance of 800 feet on the east ledge, it, as well as the other tunnels, following the direction of the lode. The walls are well defined on the mountain-side, and for 300 feet there was nothing met with but decomposed rock. Soon, however, the ore-body was struck, and as work has been carried forward, a proportionately larger and richer body of ore has been brought to sight. The ore is of the character known as "ribbon-rock," and is stained with tellurides, the sulphurets being arranged in streaks through the ore, from wall to wall, and averaging from two and one-half to three per cent, with much free gold in places. The width of the vein in this level is 12 feet.

The ventilation is good, as the upraises have been carefully planned; timbering good, but only necessary in connection with stoping work. The stope in tunnel No. 4 is 200 feet long and opens up a fine body of ore. Ore is also being taken out of levels 2 and 3. A gravity tram conveys the ore from the second to the third level, a wire rope-way takes the ore from No. 3, passing No. 4, and taking it from there to the mill. There is 627 feet fall from No. 3 to the mill, and the cable is 10,400 feet long. The buckets carry 125 pounds of ore, and the cost of running is trifling.

Level No. 1 is 330 feet below the summit and is 300 feet long. Level No. 2 is 85 feet lower; length, 600 feet. Level No. 3 is 120 feet lower than No. 2; length, 1100 feet. Four years of continuous work have been expended by Mr. Hart upon this property, with the exception of Sunday, which Mr. Hart believes should be a day of rest for all hands.

The plant consists of a 20-stamp mill with eight concentrators and a number of Morris tables for slimes. A Dodge pulverizer was first in use, then a ten-stamp mill. There will now be 40 stamps necessary to keep pace with the ore in sight. A steam-pump takes water from the Sacramento river close by, and a very large tank is kept constantly filled; this supplies the mill and is a safeguard in case of fire. There is immense waterpower in the Sacramento, as the river is wide and deep, with a powerful current all the year round, fed hy the melting snow on Mount Shasta, 14 400 feet high.

The grade of the concentrates is high. Selby's returns were carefully examioed, Mr. Hart's courtesy allowiog this privilege. The average is $250 per ton in gold, the highest being $500. They also carry some silver, about $14 per ton all round. The percentage of sulphurets is two and one-half to three per ton. Ore lately taken out goes even higher, and, owing to its richness in sulphurets, it is being shipped to Selby's smelting works as it comes out of the mine. A store, postoffice and substantial buildings indicate a prosperous community, and Mr. Hart is to be congratulated upon his judgment and the manner in which he has persevered in opening up hls property. Plans for a cantilever bridge across the Sacramento have been made, and the railroad company have agreed to make connections, etc., on the opposite side of the river.

WM. G. HODSON, A. B. T. C. D.

Mining in Washington.

The mining outlook for the State of Washington is flattering, says the Seattle *Mining News*. Last year many hundreds of mineral locations were made; this year assessment work necessary to hold the property is being done in every district, and richer finds and better ledges are the result. Not one quarter the gust and blow that we heard last year is heard now, hut quiet, energetic work is going on. Last year no mining districts were reached by the locomotive; only preliminary surveys were made. This year millions of dollars are being put into railways leading to the mining districts. Last year the suggestion of a railroad to a remote mining district was ridiculed; now permanent surveys have been made, and strong companies organized to build the road. This is an off year; presidential year. Money among the masses is exceedingly close; no excitement in any legitimate business; all is quiet. The mining locations, as a rule, are only receiving a little necessary work to entitle the claimant to government protection; this, however, is not proof that the properties are not first-class, and may not bring rich reward to the owners. As a further proof of the value of these claims, we hear almost every day a miner, from some mining State or Territory, say that were prospects he sees here, in this or that camp in the State or Territory from which he hails, they would sell readily for much greater figures than is asked for them here. Many old prospectors openly express disgust at the figures fine mining claims are being sold for, a mere bagatelle, they claim, as compared with what a similar claim would bring in their former home. This is a substantial proof as to the depression in mining properties in Washington to-day. But with the advent of roads, railroads, and good wagon-roads taking the place of almost impassable pony-trails, ore can he shipped to the smelters, or concentrators can easily be shipped in. Another year will see all this done. The dull smoldering, that now is, will break forth into a flame that will please the patient ones. Next year, when the carloads of ore rich with gold and silver come rolling into the Sound cities, it is bound to create an excitement that will give such an impetus to mining as has not been felt on the Pacific coast in many a year. Any one who will take the time to post himself will admit the facts and logic of the above; yet the mining men do not realize what is just before them if they will wait with patience. Some of them will trade off their birthright for a mess of pottage any day, and consider it a good deal as did one of old. Washington's coal and lumber is being shipped to California and Australia, her lumber to Chicago, her wheat to Liverpool, but her greatest industry lies dormant, wrapped up in the bosom of the earth; but just now the mining world is beginning to look this way; letters of inquiry are beginning to come in; soon will follow men with means to develop as fine prospects as can be found in any country. To the present time, men who have invested in Washington properties have done so as a pure speculation. They are not mining men, do not intend to mine; they bought to sell again. Men that we are now looking for are mining men, men of experience in mining, who will take hold of the unbought prospects and make mines of them.

Scientific Progress.

Disinfectants.

Despite the immense progress made of late years in the study of bacteriology and kindred matters, somewhat vague ideas exist on the part of the general public, as to both the action and effectiveoess of disiofectant agents. Under this head we include, in the first place, all chemicals capable of destroying germs of any sort, by the diffusion of vapor or gas in the surround ng air. Many, but not all, disinfectants are antiseptics as well. They are all deodorants, *i. e*, the odor will overpower those of the drain or sick room; but all deodorants are not necessarily thorough disinfectants. Disinfection can, in the second place, be attained without the use of any disinfectant whatever—*i. e.*, by the agency of heat. This is more seldom resorted to, because it is often inconvenient to apply it. Scientists assert that the germs of nearly all known diseases resist any temperature up to 230 degrees, so that the boiling point, 212 degrees, is not sufficiently high. To attain the former temperature, apparatus must be used, to which we will refer after dealing with chemical disinfectants.

CARBOLIC ACID.

The commonest household disinfectant is probably that sold under the name of crude carbolic acid. This consists in a mixture of pure carbolic and cresylic acids, and is of a reddish brown color. Its strong, tar-like odor renders it a not unpleasant deodorant, but its solubility in ordinary water, which is in inverse ratio to the amount of cresylic acid present, is at first sight a considerable drawback. It mixes, however, much more freely with hot water, and for all practical purposes the solution thus produced is sufficiently useful. Patients sometimes object to the smell, in which case some other disinfectant must be chosen, but it is not disagreeable to the majority, while its cheapoess renders it acceptable in prisons, public offices, railway stations and private houses, where economy is an object. A refined preparation of the above, known as crystalline carbolic acid, is, though dearer, of much more easy application. It mixes readily with warm water, so that a saturated solution is easily made, and it is not only a disinfectant, but is largely used by medical men as an antiseptic in dressing wounds, etc. It may not be generally known that pure carbolic acid produces a disagreeable though not daogerous result when applied to the bare skin. An assistant connected with a public museum, of which we were in charge some years ago, plunged his hand and arm into a bucket containing a quantity. A smarting sensation caused their hasty withdrawal, and for some little time he was much alarmed. Speedy treatment with olive oil, however, at once mitigated the pain, and although the skin became shiny and the epidermis peeled off, no serious results followed. For everyday, domestic use, carbolic acid in either form is probably the best disinfectant procurable. We need hardly say that its action on the mucous membrane is most disastrous, and that if any quantity be taken into the mouth, death will probably result; great care should therefore be taken to keep bottles containing it away from the chance of being handled by children. It is also dangerous to the eyes if a drop accidentally splashes into them.

SULPHUR.

Sulphur is an older and better known disinfectant than carbolic acid, but its application is less convenient. It is, in the first instance, necessary to make the room, etc., to be disinfected reasonably airtight, so far, at all events, as shutting all doors and windows goes, while its fumes are so distressing to human beings that few can stand their application for even a short period. In former days it was extensively used to fumigate vessels which had become overrun with rats or whose crews had been subjected to the attacks of yellow fever, cholera, etc. In some cases vessels were both fumigated and sunk. In hospitals, prisons, etc., it is of course practicable to fumigate wards, etc., with sulphur when the inmates have been removed, and no great difficulty is presented by the same operation in a house, provided the room to be treated can be kept unoccupied duriog its progress. This usual way of fumigating is to take about an ounce of sulphur to every 20 cubic feet of air space, and place it in a metal pan or dish, floated on the surface of water in a bath or tub. It readily ignites, and should be kept burning for at least a couple of hours.

CHLORIDE OF ZINC.

Chloride of zinc is a favorite disinfectant with many people. It is dissolved in water, and the clothes, etc., to be disinfected are plunged into the solutioo and then dried. It is less used now than formerly, but before carbolic acid became popular was greatly relied on. It is not so powerful a deodorant, and some people dislike the smell, but it is a handy household adjunct.

SULPHATE OF IRON.

This substance, which is commercially cheap, is a capital disinfectant when large quantities have to be applied, as in the case of drains, cesspools, etc. It is not dangerous as a poison, and may therefore be used by persons whose discretion when handling carbolic acid, etc., is doubtful. Hospitals at one time used it a good deal, especially in the United States.

CHLORINE.

This is an admirable disinfectant, but its application for domestic purposes is even less convenient than that of sulphur, inasmuch as not only must every aperture in a room be carefully stopped up, but a chemical process has to be performed. A writer in the *American Druggist* gives the following formula: The cubic space having been calculated, one ounce of a mixture composed of equal parts of sodium chloride and manganese dioxide, to which is subsequently added a fluid-ounce of a 50 per cent solution of sulphuric acid in water, is taken for every 100 cubic feet of air space. On the addition of a sulphuric acid solution to this mixture chlorine gas is freely liberated. Any compound of this gas which contains it in loose combination is well adapted for ordinary household use as a deodorant and disinfectant. The official calx chlorioata is a good example of this; when freshly prepared it contains about 33 per cent of available chlorine, which is rapidly parted with on simple exposure to the air. A solution of it in water, of the strength of four ounces to the gallon, is recommended by the American Public Health Association in the disiofection of excreta.

Other preparations of this substance in frequent use, adds the writer, are represented by Labarraque's solution and Javelle water; but the false sense of security engendered by the use of these and the chlorinated lime, when employed as deodorants, is to be carefully guarted against, their peculiar properties of neutralizing bad odors not always being a sufficient evidence of thorough disinfection.

DISINFECTION BY HEAT.

Returning to the question of disiofection by heat, its application is beyond the range of ordinary domestic arrangements. Dry heat is less effective than moist, the latter being applied by filling close chambers with moist steam under high pressure. But while, as above pointed out, boiling water is not necessarily of a sufficiently high temperature to serve as an absolute disinfectant, its use is highly advantageous if extended over a prolonged period. Boiled water is, under all circumstances, safer for use than water which has not been boiled, and clothes which have been boiled for some time are less likely to carry infection than those which have been simply washed. It may be useful to add, in conclusion, that no known organism resists a temperature of 270 degrees.—Discovery (England).

Manufacturing Artificial Stones.

The manufacture of artificial stone has been based upon the application of silicate of soda, which certainly produces, in combination with different stone compounds, a fair material as to strength and appearance, but is found to be liable to cracks, and finally ruptures, during the course of time.

The object of the new invention is to produce an artificial stone in the manufacture of which the fundamental material is silicic acid, which is beforehand deprived of all bases or salts, especial care being taken that no alkaline salts remain therein, which is done by absorbing the same by acid of lime. The silicic acid being powdered aod subjected to treatment, may be thereafter added to any of those compounds necessary for the various imitations. Another important feature in combination with the process is to subject the ready molded stone to a steam bath, and thereafter to a treatment with chloride of calcium The product is said to be by no means inferior to real stone as to its aspect nor as to its strength, or as to its liability to be influenced by weather or time.

Silicic acid, after being ground to powder, is cleansed from all impurities by ordinary means, and five to ten per cent thereof mixed up in warm, river or rain water, which either is applied to slaked well-burnt lime or is added to hydraulic lime. The resulting product of this process, which is silicate of lime, is mixed with sand and also small portions of fluorspar. This mixture may be cast into molds, so as to give various shapes, as desired. The molds then being removed, the castings are allowed to dry as long as 12 to 24 hours, after which time they will be as dry as atmospheric air. They are then brought into a steam boiler aod steam blown through, so as to drive out all air, after which the boiler is hermetically closed up and steam let in uoder a pressure of 10 atmospheres.

In this high-pressured steam bath the stones remain 48 to 72 hours, and thereafter they are submitted to a bath of boiling and saturated chloride of calcium during 6 to 12 hours, also under a pressure of about 10 atmospheres, which may be dooe in the same boiler. The condensed water may be used for the bath. These stones are allowed to dry in the open air, or, when desired to dry quickly, steam may be once more made to circulate inside of the boiler after the chloride of calcium has been withdrawn, and before the stones are taken out. These stones also take any desired coloring and polishing, like common stone.

It is claimed that artificial stones manufactured by processes known heretofore were never perfectly deprived of all salts or bases, which are the causes of the destruction of the material, because all salts have the natural teodency to attract and absorb acids. This also is the case with small particles of bases contained in artificial stone known until this day. They draw carbonic acid out of the atmospheric air, and combine themselves chemically therewith. These particles of bases, however small, when bound to acid, expand and force the neighboring or surrounding material to separate, thus causing rents and cracks. These cracks in the beginning are scarcely visible to sight, but widen and deepen in the course of time, soak up water, which water in itself, by freely giving off carbonic acid to the bases, eohances the destruction of the stone, and also may lead to complete and sudden rupture when in winter the water freezes, and thereby expands. This, it is asserted, is not possible in stones manufactured by this new process, and they are also perfectly fireproof and will stand agaiost weather like ordinary stooes.—Paper Trade Journal.

Mechanical Progress.

A New Cast Iron Decorating Method.

Mons. Faure has devised a new process for the decoration of cast-iron objects. During the last few years, he says, the demand for heating apparatus and other cast-iron articles has grown considerably, chiefly owing to the circumstance, he thinks, that every effort has been made to render them more agreeable to the eye by the employment of various exterior coatings, such as, for instance, enamel, nickel, copper, etc. These divers decorative methods have, however, the fault, Mons. Faure avers, of exhibiting too great a uniformity of tone. It is this presumable defect which he has set himself to correct, and he believes that he has obtained his object by the application to the casting of a coat of enamel and of metal, or of two layers of enamel of different shades. To obtain the desired result only fancy articles should be treated, the reliefs of which are as much as possible on the same plan, as the work is hereby rendered both less difficult and less costly. With a casting of this description, the operation is conducted as follows: First, the entire surface of the piece is enamelled with any required shade; the casting is then passed to the file-wheel, which removes the enamel from the relief portions, and afterward to the burnisher, which polishes the reliefs. The first part of the manipulation finished, the article is taken to the nickel, copper or other metallic bath. The metallic deposit of course, only adheres to the burnished surfaces. A casting is thus obtained with the indentations enamelled and the reliefs copper-plated and nickel-plated, etc., as the case may be, or even simply polished, the result being a very fine imitation of wainscoting. To obtain another decorative effect, the relief parts of the article could be bronzed as soon as it has been subjected to the glazing operation. Still another embellishment may be procured by first enamelling and glazing the object as indicated above, repassing it through the furnace, and then applying a second coating of transpareot enamel of a different shade from that of the primary layer. It is easy to understand that the indented portions having two coats of enamel, and the relief parts only ooe, the surface of the casting would present a very fine diversity of tones.—Iron.

SAND FOR MOLDS.—A good sand, says the *American Manufacturer*, should be refractory to the highest degree; it should neither crackle in contact with the liquid metal, nor set free too much gas; it should neither split nor become too compact on extreme dryness, as the withdrawal of the castings would become too slow and difficult. There are several mixtures of refractory materials, more or less plastic, capable of furnishing good casting molds for steel. The following is one formula: 52 per cent of the debris of broken crucibles, 43 per cent of the debris of refractory bricks, 5 per cent of clay. Sometimes, when this mixture is found to be too close, cokedust is added, which thins it out and increases its porosity. The casting sand for steel is ground up and mixed in the ordinary manner for moulds for pig. A little molasses is sometimes added to render it more workable to the hand. After the model has been removed the molds are washed over with plumbagine and then dried in a stove. When the form of the casting permits of a regular shrinking it is left to cool in the mold, but most frequently there would be risk of fractures and the removal must at once be proceeded with. The castings are thrown, while still red hot, into a furnace to cool, brought to red heat, and recooled along with the furnaces By operating in this way fractures are almost always avoided.

Cast Steel for Dynamos.

Some years ago dynamo specifications always provided that the field magnets should be made of the best Swedish wrought iron, and that the copper used was to be of 98 per cent conductivity. No one knows what difference it made to the customer what iron or copper was used when the output and efficiency were specified also; but probably the consulting engineer thought it made him appear as if he fully understood dynamo design. It is needless to say that dynamo-makers used the iron that suited them best, and called it "Swedish," and the consulting engineer looked very scientific, and examined the machine carefully to see if the brushes were set at the particular angle he had specified. The idea that there is some special virtue in wrought iron for magnets still lingers, but many makers have found that it is better to use cast iron, in spite of the extra copper required to reach around it, because the extra cost of the copper is more than compensated for by the saving in labor in using a casting that needs comparatively little machining. There was some excitement among dynamo-makers when "mitis" metal came to the front. Mr. R. C. Jackson patented dynamos made of it, and others also made inquiries and experiments. The price was too high, however, and "mitis" metal never came into use for dynamo work. Cast steel is now rapidly coming to the front for large dynamos. Mr. C. Frewen Jenkin designed steel dynamos for the London and North-western Railway Works some years ago, having first tested the cast steel made at Crewe, and having found it almost as good as wrought iron. Now Messrs. Crompton & Co. are using it, and Messrs. Brown & Boveri employ it in all their large machines. The only difficulty is to get good castings. This is possible when they are large, but dynamo-makers now want small castings, which are quite sound, and do not cost as much as wrought iron, or as the same magnetic carrying capacity in ordinary cast iron. —Industries.

BICYCLE-FRAME CONSTRUCTION. — A Coventry firm has for some time past been experimenting on a new method of constructing the frames of safeties and cycles. By its means, says the *Cyclist*, they are enabled to entirely do away with castings and stampings, and the whole frame is built entirely from weldless steel tube and sheet steel. Under the new method the fork crowns, the bottom bracket and the barrel of the steering post are made of sheet steel bent into a circular shape, and left with projecting lips. The tubes are split for a length of two inches, and into these the lips are fitted and fixed by brazing in the usual manner. The advantages are that the difficulty which has hitherto existed in brazing heavy castings, or stampings to a light tube, is entirely done away with; the joints, when plated or enamelled, are quite invisible; the frame can be made far lighter than at present, and is of the same thickness throughout. Where it is deemed necessary to strengthen the barrels, shoulders are introduced and brazed into the inside. A roadster frame made in this way weighs just over three pounds, and the firm are so satisfied with the trials of their experimental machines that they have decided to construct all their 1893 cycles on these lines. The process has been, or is being, patented throughout the world.

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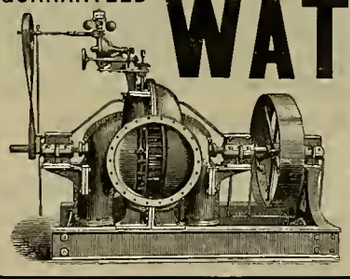

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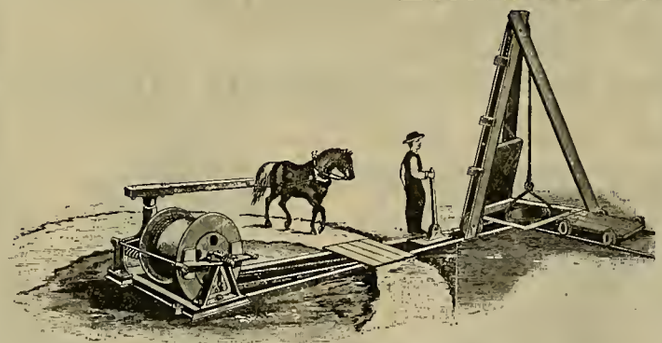

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Useful Information.

Exterminating Mosquitoes Around a Country House.

A writer on the subject of the extermination of the mosquito tells of an experiment he made with kerosene as the destroying agency in the Catskills. Noticing a few mosquitoes about the porch of his cottage on July 5th last, he made a search for their breeding place and found it in a rain-water pool, having a surface area of 60 square feet, in the neighborhood. Eggs had been deposited freely on the water, and it was very plain that the cottager was destined to be annoyed by innumerable mosquitoes unless a remedy was applied at once. He determined to apply kerosene, and sprinkled four ounces of it over the surface of the pool. At the end of ten days it was covered with dead insects, which the writer estimates at 7400. Most of them were gnats, but there were 371 female mosquitoes and many males. The number may appear trifling enough, but on that score the experimenter has this to say: "Now, the average number of eggs laid by a female mosquito is 300, and the destruction of these 371 specimens prevented the development of 111,300 individuals of the next generation. Moreover, certain females flew away after touching the surface of the water and undoubtedly died at some distance from the pool, so that the effect of the application was even greater than these figures indicate. In fact, the capacity of the remedy was only limited by the number of the mosquitoes seeking the surface of the pool for egg-laying purposes, and in a locality of greater mosquito abundance the estimates of the potentiality of the remedy would have been enormous. And now as to the question of expense. This experiment proves that at this rate of application one barrel of kerosene costing $4 50 (and the cheapest of oil is preferable to the more expensive) will successfully treat 96,000 square feet of water surface. It is probable that there are many mosquito-ridden neighborhoods where the total area of the breeding places does not exceed this figure, and where at the slight expense mentioned, provided the application be made early in June, so as to head off the first generation, the numbers of the biting pest may be reduced to a minimum.—N. Y. Evening Post.

WHERE THE GOLD HAD FLOWN.—"Guld," says a mintmaster, "melts at 2016 Fahrenheit; but it evaporates and passes off at a much lower temperature than melting heat, and also if it be maintained in a molten state for any considerable time before it is passed into an ingot." Ignorance of this metallurgical law once caused consternation to temporarily reign in the hearts of the staff of an American coinage factory. Soon after the San Francisco Mint commenced operations, an inspector visited it to take stock, and discovered a shortage of about $160,000. The employes expressed amazement, which quickly developed into dire alarm when arrests for theft were threatened. But before it was deemed necessary to adopt such stern measures some one suggested that evaporation had caused the deficiency, and that the missing metal had gone up the chimney. Acting upon this hint, a daring individual ascended the flue, and, to his own and his comrade's great relief, he found the lost gold on the roof, where it had condensed as it came in contact with the air. The slates were taken off the mint building, and the tiles of a church and other contiguous edifices were also removed. This argillitic collection was ground to a powder, and the gold was recovered. The brickwork of the furnaces and chimneys of the mint was similarly treated; and after the San Francisco authorities had regained as much gold as they could with the appliances which they possessed, the dust was sent to the Philadelphia Mint and worked over more closely. Finally the triturated material was sold to French chemists, who intended, it was understood, to subject it to a still more careful manipulation. In this way more than one-half of the original deficit was eventually covered.

PROF. VERNON BOYS lately brought together in the United Presbyterian Church Synod hall, Edinburgh, a monster audience to hear his lectures, with experiments, on "Electric Spark Photography." In the course of the lecture, Prof. Boys explained that, by the electric spark, articles moving at the rate of 10,000 miles an hour can be photographed, and by the introduction of a revolving mirror, a speed of 180,000 miles an hour can be coped with. The mirror makes 1024 turns every second, worked by electricity, which is equal to about 150 times as fast as a rifle bullet travels. The whole photographic power of the spark is over in a time equal to the ten or eleven millionth part of a second, and it is during that incredibly brief space that the image is made on the sensitive plate.

CYANIDE PROCESS TESTS.—All experiments upon ores with the cyanide process are being watched by mining men; accordingly the following from the *Chloride Belt* of Candelaria, Nev., will be read with interest: Professor Storch the well-known metallurgist, arrived here Wednesday from Silver Peak, where he has been for the past two months. During this time he has made a thorough test of the cyanide process and demonstrated to his satisfaction that it is the most successful method of treating gold tailings. He did not make any tests on ore, but confined himself to old concentrates, the property of John Chiatovich. These concentrates consist of over 80 per cent of hard, indissoluble lumps, while hardly 20 per cent of the stuff will pass a No. 40 screen, and as the whole was tested without separation, the following result was obtained: After 24 hours' filtering, 34 per cent of gold from the fine stuff and only two per cent from the lumps; after 51 hours' filtering, 58 per cent of gold from the fine and nine per cent from the lumps, and so on. An equally successful test was made with the John I. Blair tailings at the old Silver Peak mill. There are many thousands of tons of these tailings at the Peak, and the demonstration, by a gentleman of Professor Storch's reputation, of the fact that they can be profitably worked, is of importance to this entire section. The professor has designed a leaching plant of 20 tons daily capacity for John Chiatovich, which will be erected at once at the Peak.

TWIN screws beat side wheels in a scrub race between the Sound steamers Puritan and Richard Peck. The latter is a new steamer built at Wilmington, Del., for the New Haven line, and is the first boat regularly running on Long Island Sound to use twin screws, though single-screw steamers have been running for some time.

IT is claimed that the addition of a percentage of sodium to molten copper not only makes it cast sound, but also hardens it. A patent has been issued to the discoverer, Mr. I. D. Bottome, of New York city.

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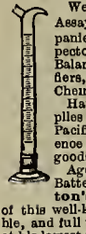

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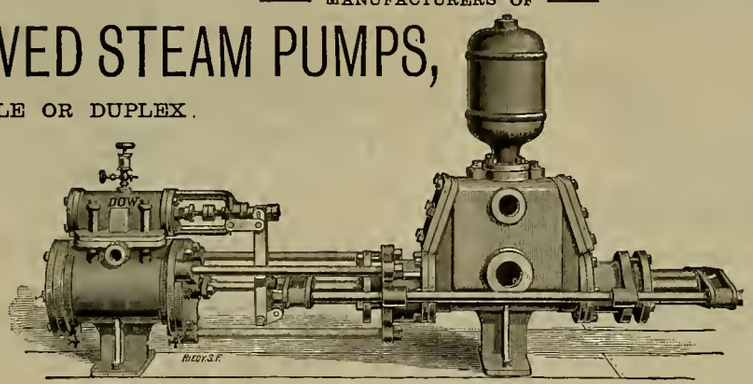

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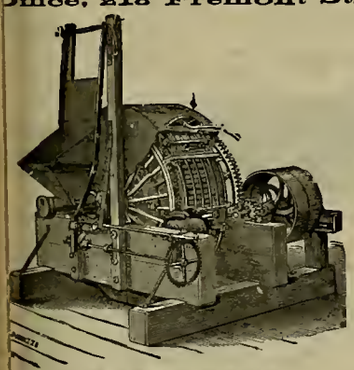

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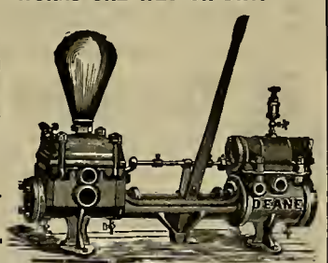

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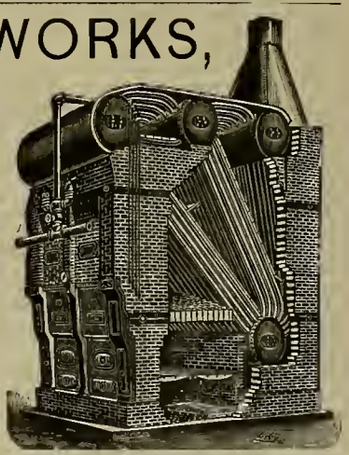

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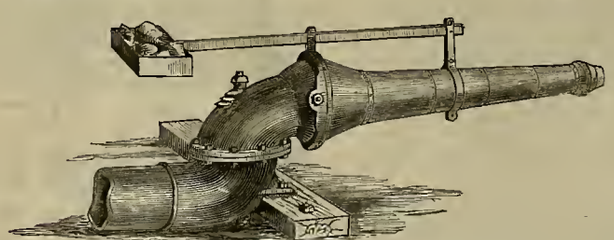

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The controversy over the fundamental patent for the incandescent lamp is finally settled. In a supplement to the *Electrical Review* was given a digest of the decision of the United States Circuit Court of Appeals, sustaining the Edison claim to a filament of carbon mounted in an all-glass vacuous globe. The second claim, which was the bone of contention on account of the alleged vagueness of the term "filament," was thus paraphrased by the court: "The combination of carbon, filamentary or thread-like in size and properly carbonized, used as an illuminant in an incandescent electric lamp, with a receiver made entirely of glass and conductors passing through the glass, and from which receiver the air has been exhausted to such an extent that disintegration of the carbon, due to the air, wasting action of surrounding gases, or to any other cause, is so far reduced as to leave the carbon practically stable." This construction is sufficiently broad to include all forms of incandescent lamps now on the market, and puts in the hands of Mr. Edison's assignees a monopoly of the entire lamp industry.

Thus after many years the inventor is placed in full possession of his own creation, for to Mr. Edison more than any other undoubtedly belongs the honor of creating the industry of incandescent electric-lighting. It is unfortunate that the legal processes of sustaining or defeating a patent are so slow. The contest just concluded has been fought for seven years, during which rival companies have invested heavily in incandescence-lighting, believing, with what Judge Wallace thought was good warrant, that the patent was too uncertain in meaning to be given the scope claimed for it by its friends. Unhappily, the same charge might be laid with more or less effect at the door of every broad patent. The draughtsman of a claim is confronted by two difficulties. If he makes it too broad, the patent is void; if too narrow, the patent is worthless. In either case, his client's rights are forfeited. Confronted by Scylla on one side and Charybdis on the other, he steers between as best he can. It is utterly impossible for the human mind to anticipate all ramified by-ways of future infringers. This predicament accounts for much of the alleged vagueness of patent claims. It is simply a selection of terms of definition sufficiently elastic to bear a little shaping at the hands of the court. The word "filament" has proven to be a term of this character. In the light of Mr. Edison's great contribution as a pioneer of the art, it might be said those who ignored his patent did so wilfully—his equities in the case were strong; but on the other hand the prior state of the art had shown burners of various degrees of thickness—some of which might have been logically described as filaments, thus throwing a cloud over the patent which rendered its ultimate triumph doubtful. There is a cure for these difficulties; if the fate of a patent could be definitely settled in a year—and it ought to be—all business dependent upon patents would be put upon a firm basis, invention would be stimulated by the promise of quick reward, the courts would be relieved, the infringer could apply his energy in more useful work, and increased prosperity would result all around.

So far as the general public is concerned, the decision will doubtless not be felt. The light will be just as cheap and just as good. Whether the rival types of lamps will be made at an Edison factory, or licenses will be given to the several makers, remains to be seen. The Edison Company, or its assignees, will pocket some dividends and those who, believing the patent worthless, went into the lamp business, will resign themselves to the situation. In about four years, at most, the patent will expire and the making of lamps, so far as this patent is concerned, will be public property.

THE RESISTANCE OF METALS AT LOW TEMPERATURES.—The *Philosophical Magazine* for October contains a preliminary account of some highly interesting investigations by Professors Fleming and Dewar on the electrical resistance of pure metals and alloys at exceedingly low temperatures. Measurements were taken at temperatures ranging from the boiling point of water 100° C. to the boiling point of oxygen 182° C. The most striking fact elicited by this research is the enormous decrease in specific resistance experienced by perfectly pure metals when cooled down to these abnormally low temperatures. Thus the specific resistance of copper at the boiling point of oxygen is only one-sixteenth of what it is at the boiling point of water and that of iron is only one-twenty-third. The results plotted out as curves (temperatures, ordinates, specific resistances, abscissæ) go to show that at absolute zero the specific resistance of the pure metals is in all probability absolute zero also. The low temperatures employed were also very sensitive detectors of impurities. For instance, two samples of nickel, one nominally pure, and the other so in reality, both exhibited much the same specific resistance at 0° C., but at 182° C. the pure specimen gave the figure 1900 C. G. S. units, while the impure article gave 6737. In the case of alloy, the curves, which are approximately straight lines, show no tendency to pass the origin at absolute zero. When the alloys are compounded of chemically dissimilar metals, such as platinum-silver, the deviation from the vertical is slight. On the other hand when the constituents are chemically similar (platinum-iridium) the deviation is more pronounced resembling that of impure metals. Another fact of interest elicited by Profs. Dewar and Fleming is that down to 182° C., at any rate, carbon continues to behave as an electrolyte; i. e., the colder it is the higher is its specific resistance. Experiments are now under way on selenium, sulphur, antimony, arsenic and various insulators.

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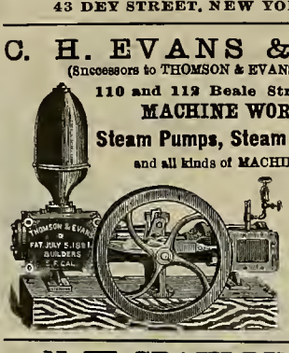

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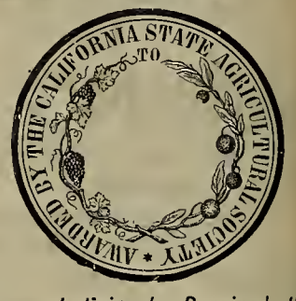

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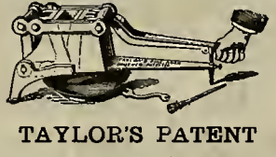

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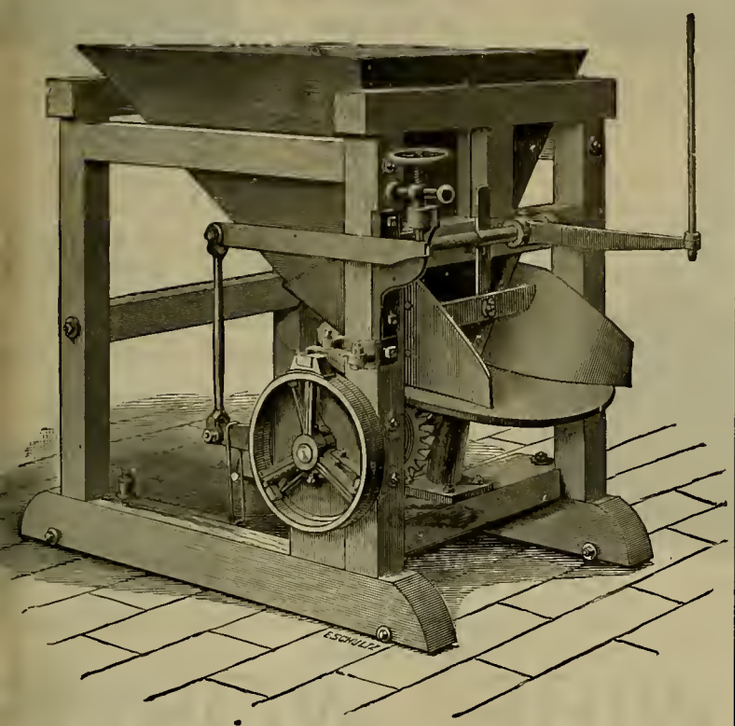

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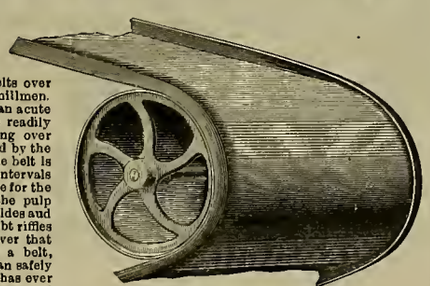

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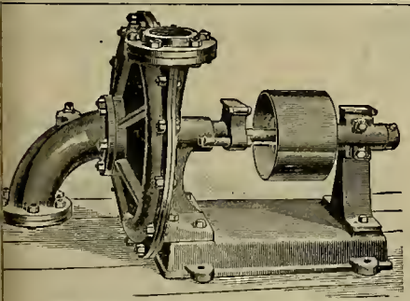

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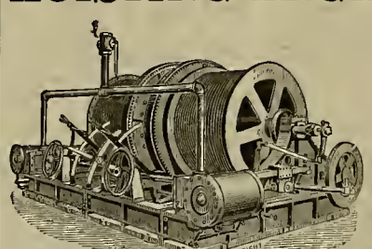

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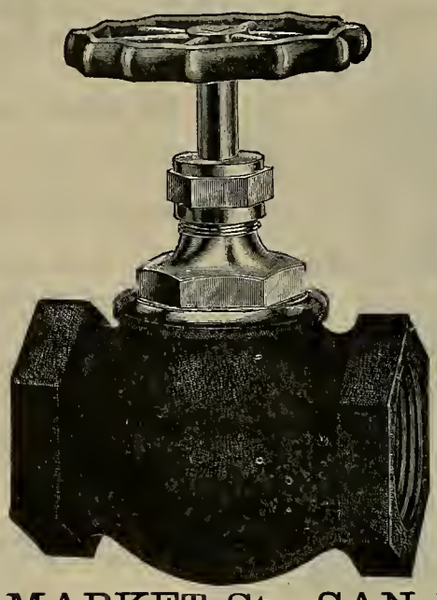

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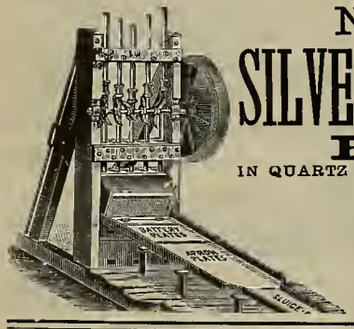

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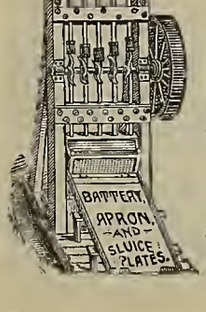

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Cleveland has swept the country. Besides the solid South, he has carried New York, Illinois, Connecticut, New Jersey, Wisconsin, and probably Indiana, Ohio, Wyoming and California. Involved in this success is the next Congress, which will be Democratic by from 65 to 100, and the next Senate, which will be Democratic hy a majority of from five to ten. In those States which remain steadfast for the Republican party, the majorities are elsewhere reduced. It is, in fact, a tremendous landslide, an overwhelming defeat for the Republican party.

Colorado, Kansas and Nevada will cast their electoral votes for Weaver, but in Oregon and North Dakota, where he was supposed to be strong, the advarse vote was decisive. As yet (we write Thursday P. M.), we have only general reports from the several States and cannot, therefore, giva definite figures.

In California the count is not yet complete. At 4 P. M. Thursday, 1477 precincts report 99,738 votes for Clavaland, 97,869 for Harrison and 17,805 for Weaver. Tha Prohihition vote is not given. It is probahle that Cleveland has carried hy a plurality of from four to five thousand. In the First Congressional District, Geary (Democrat) is elected to Congress over Davis (Republican). There are as yet no returns from Modoc county, but exclusive of this county the district gives Geary 10,539, Davis 6955 and the Peopla's Party candidate 475. In the Second District Caminetti (Democrat) is elected. Incomplete returns give him 15,715 to 13,012 for Davis (Repuhlican), and 23 for the People's Party candidate. In the Third District, English (Democrat) has 11,232 while Hilborn (Repuhlican) has 11,172, and Lyon (People's Party) has 2785. A partial count in the Fourth District (San Francisco) gives Maguire (Democrat) 11,385, Alexander (Repuhlican) 10,186, Burman (Peopla's Party) 1295. Incomplete returns from the Fifth Distnct indicate the election of Loud (Republican) by a narrow msjority. In the Sixth District, Cannon, running as the candidate of tha Democrats and of the People's Party, carrias the district by nearly 5000 majority. In the Seventh District, Bowers (Republican) is elected by a narrow plurality. It is still too early to estimate the complexion of tha Legislature, but it is probably Democratic, and will therefore elect a Democrat to succeed Felton in the United States Ssnate.

In San Francisco the count is very tedious, but the indications are that Ellert, the Non-Partisan candidate for Mayor, is elected hy a narrow plurality. Scratching was universal among residents of the city, and the result is so mixed that naither party will be ahle to claim the administration. The Democratic vote was broken up and scattered among a multitude of candidates, hnt on those names where it was united, it showed a majority over all of ahout 7000.

For the first time the Australian Ballot System was used in this State and with very general satisfaction. While it puts the voter to some little inconvenience, it is a bulwark of defense against fraud and brihery. It is perhaps natural in view of this fact that those whose interest lies in the corruption of politics should inaugurata a savage warfare against it.

The bearing of Mr. Clevéland in victory and of Mr. Harrison in defeat has been alike dignified and in perfect tasta. In rasponse to congratulations, the President-elect has spoken briefly and modastly, while Mr. Harrison has gone ahout his official business as if nothing unusual had happened. There was no trace of disappointment in his appearance or speech. He has already declared his purpose of returning to Indiana after his official term, but will, perhaps, spend some months in Boston as the guest of his daughtar, immediately after leaving the White House.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

ZEILE.—*Ledger*, Nov. 5: The Zeils shut down on Tuesday for repairs. It is proposed to repair the shaft, hoist and mill thoronghly. The work will take two or three months. In the meantime a large nnmber of minars will be laid off Tha mining interests around Plymouth are starting up again. San Francisco parties have taken hold of the Osceola mine and are ready to let a contract to run a 300-foot tunnal. Tom Bawden's claim, sonth of the Bay State, has been bonded by Dr. Boyson, who intends to sink a shaft and thoroughly prospect the ledge. The first shipment of bullion from the Bay State mine was made on the 25th of October. Three hnndred tons of rock crnshed in the Plymonth mill returned $1913 in gold, and yielded five tons of sulphurets which produced $421, making ths rock average $7.78 per ton. A contract has bean let to Knight & Co. of Sutter Creek for a hydranlic engine and pump with a capacity of 300,000 gallons in 24 hours. Work on the plant is being pushed forward as fast as possible, and when complete, sinking and drifting will be inaugurated.

SUTTER CREAK.—Everything in connection with the mines is steadily improving, and is already in excellent shape for the winter. The teams ara nearly through hauling material, and if the rains were to come there would be no damage dona. At the Hector tbs entire mill is kept running steadily and no doubt expenses are mors than bsing paid. The Wildman mill is also being run to its full capacity, and everything is on a good paying basis. The air has somewhat improved since the new air blower has been put in, although there is great complaint among the men yet. The Belmont is still being run in the same manner, and they are anxions for heavier hoisting power. Mr. Tibbitts is very sangnine that they have one of the best paying mines in the county, but need proper machinery to enable them to keep the water ont and develop the property. Things at the South Enreka are about ready for sinking, and in my next I expect to be able to report considerable headway in this direction. Knight & Company have all the business on hand they can possihly attend to. The shop is foll of work, and an additional force of men is being put on occasionally.

Butte.

PAOGRESS AT FOABESTOWN.—Oroville *Register*, Nov. 3: Superintendent Stont informs us that the 40-stamp mill on the Stow mine is now ready for operation and that it was the intention of the manager to start it up this week. Twenty stamps have been running for a long time past, bnt 20 new ones have now been added to the mill, making it one of tbe largest in the npper part of the State. The chlorination works of the Shakespeare mine will be ready for operation early this month. It is said these works have cost $30,000. An immense quantity of material has been shipped from here, inclnding machinery for pumping and hoisting and some 10,000 pounds of acid. The hotels are all crowded and business of all kinds is very lively.

BROWN HILL MINES.—James Wheeler was down from Brown's Hill last week and says the mines there are very promising. In the Wheeler mine the tunnel is now in 740 feet, with gangways across tha lead, each 50 feet. The tunnel is timbered with a set of posts every four feet. The gravel is very rich, and be thinks from what tests they hava made that it will average from $7 to $15 to the carload. They have a large quantity ont bnt will not be able to wash any of it till the winter rains set in. Willett & Richardson are opening a gravel mina on a high bar near the river, and to obtain water have dug a ditcb one and a quarter miles long. He is confident they hava a good mine. Willett has one of the most promising quartz lodes in tha State, but lacks the money to develop this as it should be. He has a tnnnel in 320 feet and has sunk upon the ledga to a depth of 60 feet, and finds the deeper he gets the richer the quartz is. Willett himself is confident that he has soma of the best quartz ever found and thinks portions of the lode will go $1000 to the ton. The prospects in the Cascade mine, owned by Messrs. Higgins, Perkins and the Wilcox brothers, are good. This mine has been prospected for a number of years, but looks now as though the owners would be well rewarded. Wolters brothers, of Gibsonville, have for a nnmber of years been running a bedrock tnnnel at immense expense, to reach a rich vein of gold-bearing quartz, and have at last tapped it and will this month begin operating their mill. They are in with their tunnel over 700 feet and have sunk upon the lode over 300 feet. The rock is good and the returns will soon begin to come in. There are 60 or 70 miners at work in the vicinity of Cascade and Brown's Hill. Some are trying to develop mines they have found and others are searching for new discoveries.

A GRAND FUTURE.—Daniel Streeter, of Biggs, and W. W. Will, who is connected with the Bishop mine at Bangor, were discnssing the mining outlook for that section of the county. Mr. Will believed that mining there was only beginning and that the old channels stretched over a big scope of country. Ha was confident that in a few years there would be a continuous line of mines from Feather river to Bangor. In this Mr. Streeter fully agreed and said that some miles below Bangor young Mr. Newbert had found excellent gravel that would pay from $8 to $10 to the man. This gravel is nnlike the blue, hard, cemented gravel ahout Bangor, it being a whiter color and there being less cement in it. The bed was extensive, stretching over several miles, and he was confident that it would pay well. Mr. Will said that the quartz mines about Hurleton were attracting much attention and he was confident that inside of a year a great deal nf work would be done in that section. Both gentlemen considered that mining was only in its infancy, so far as Forbestown, Bangor and Hurlstou are concerned.

THE MOANING STAR MINE.—Oroville *Mercury*, Nov. 5: The stockholders of the Morning Star mine announca themselves as being very well pleased with the prospects which their venture is holding out. The mine is down now 80 feet, and 30 feet of this is through blue gravel, says the *Appeal*. Two crews of men for night and day shifts are employed and the work is progressing rapidly. The Morning Star is located near Bangor and the majority of the stockholders are residents of Marysville.

Mono.

THE ELECTRIC PLANT.—Bridgeport *Chronicle-Union*, Nov. 5: The machinery for the Standard Con. electric plant passed through town on Monday last. It is to ba hoped ths weathar will continua good, that there will be nothing in the way of the early completion of the works. The 1st of December will probably see tha mill of tha company running by electric power, making quite a saving for the company, and enabla it to work lower-grada ores.

Nevada.

GOON CLEANUP.—Grass Valley *Telegraph*, Nov. 3: Messrs. Faucett and Thompson, who ars working on the Norambagna ledge, have just completed a crushing of 23 loads of ore from the upper tunnel of the mine, and the resnlt was a yield of about $19 per load. The mine is owned by Wm. Campbell of this place and tha property is certainly very valnable. Messrs. Faucett and Thompson will do considerable work on the mina, aud in the spring Mr. Campbell will have a mill put on the property.

MINA BONNEN.—A. W. Stoddart has bonded the William Tell mine from James Roach and Mr. Tonella. The Wm. Tell is located on Osborn Hill and adjoins tbe Conlin mine. There has been considerable rock taken from the Wm. Tell, and very much of it bas been very rich. It is the intention of Mr. Stoddart to begin work within a few days.

CONTRACT LET.—The company working the Hermosa mina has let a contract to James Jenkins and George Ellis for running 50 feat of drift on the 200-foot level. The above-named contractors are among the best miners in the district, and they will do their work well. The prospects at the Hermosa are not at all discouraging.

STRUCK A GOOD LEDGA.—Nevada *Transcript*, Nov. 3: The Live Oak mine, in the vicinity of the Lime Kiln, is now getting in fine condition. The mina is owned by some Sacramento parties. Mr. Wm. Werry, the well-known mining man of Colfax, has charge of sinking the shaft, and he informs the *Telegraph* that he bas sunk 63 feet in the past three weeks. The shaft is a double-compartment one and is timbered in the best manner. The angle of the shaft is 45 degrees. There has been a ledge discovered at the depth of 60 feet, and it shows free gold all through. The country down there is lined with quartz veins of very larga size, and they are easily worked. The company now owning the Live Oak will erect a 10-stamp mill immediately.

A NEW CONCENTRATOR.—Nevada City *Herald*, Nov. 7: H. R. Edmands, of England, is putting in a new amalgamator at tha Providence. It is "Mnlloy's patent," and is designed to take the place of plates. The chief features are a shallow pan about four feet in diameter, containing quicksilver: A revolving disc is suspended abova the snrface of the quicksilver, between which the pnlp passes. The quicksilver is kept in a bright condition hy passing a light current of electricity through it. The Providence mill is now running 15 stamps.

IMPROVAMANTS AT THA CHAMPION.—Nevada City *Herald*, Nov. 8: The Champion Co. started up their new mill to-day. And it is virtually a new mill, for, besides putting in 15 new stamps, they have remodeled and raised the old mill, and done a great deal of work. The new stamps were on the right side of the old ones, and are set in an adjustable contrivance which permits of any single stamp being taken out without stopping the others. The plates in front of tha batteries are divided, so that one side may be cleaned up while the other is in use. A new and larga rockbreaker was put in for the new mill, also new ore-bins, and tbe whole apparatus was set up higher than the old mill. The old part was afterward raised to a level with the new, and solid foundations were then put under the entire building. All the foundation-work, timbering and iron-work pnt into the new mill is heavier than the old, and the building will not settle any more now. An extra waterwheel runs the rock-breakers independent of the other machinery, and the old Pelton wheel which used to run tbe stamps and concentrators has been replaced with a five-foot Dodd Sigmoidal wheel. Tbe waterpipe which supplies the new wheel in the mill is laid on concrete foundations, built from the bedrock up. The mill is now in first-class shape, and will handle all the ore the mine can produce. Numerous other improvements have been made under Superintendent Zeitler's management. The furnaces of the reduction works have all been rebuilt, and a concrete wall has been built aronnd the mill to keep Deer creek from making further inroads during the spring freshets. This wall alone was a big job, it being 25 feet high from the bedrock and very solidly built. This work has taken several months' time and has cost many thousands of dollars. In bnilding the addition to the mill, an excavation had to ba mada in the steep and rocky hillside, which was a big contract in itself. Two car-tracks were laid from the bank out into the creek, and the dump there shows that an immense amonnt of earth was taken out. The next improvement is to be a new hoisting works, which will be different from the old one. The cars will be raised to a higher track to get them on a level with the ore-bins in the mill. Ths hoisting works aloue will he a big job, and will reqnire a great deal of lumber.

Plumas.

LA PORTE.—Plnmas *National-Bulletin*, Nov. 3: The Claybank mins is pushing its tnnnel ahead. They expect to drive it 1000 feet farther. Tha famous Pioneer mine at Grass Flat is being opened up by the drifting process. Once it was very rich.

San Diego.

GOOD HOPE.—Los Angeles *Farmer, Miner and Oil Reporter*, Nov. 2: Though mineral was long known to abound in paying quantities in ths districts that surround Perris valley, it was not until three years ago that anything more than surface scratching and gophering was attempted. Then tha Good Hopa mine, in tha foothills four miles sonthwest of Perris, was bought by a company represented by James G. Sigafus. The property was simply a prospect hole. Sigafus put on a forcs of men nnder the direction of a practical miner and millman, and began sinking and developing. A cruds 5-stamp mill of ancient pattern was on the ground, bnt its capacity and capability wers not of a class to mill ths ore satisfactorily. The main shaft was snnk and ths mine opened with winzes and levels, showing by msasurement an ore body valued at $250,000. This was in February, 1891, and a Bryan mill of an improved style, capable of saving 90 per cent of tha ore, and witb a capacity of 25 tons a day, was put in. This has been worked continuously ever since, crushing on an average 10 tons of ore psr day. The ore is a grayish-wbite qnartz, most of it being decomposed, carrving free gold, tbongh sulphurets are found in paying quantities. It is easily worked, one shot releasing large amounts of rock, and it mills almost up to its assav valne. The ore, from the time it was first worked, has averaged $23 a ton, the cost of working being $5 per ton, leaving a net balanca of $18. An estimate of the ore in all the workings of the mine, places the amount at 75,000 tons, which at its assayed valua would be $1,700,000. Owners of the mine have refused $500,000 for it, it is claimed.

Sierra.

THISTLE SHAFT.—Cor. *Mt. Messenger*, Nov. 5: Here we found all as bnsy as bees, under the able management of Supt. C. B. Wingate, who is thoroughly developing this extensive and valnable mining property. Most of the snpplies for winter are laid in, and the balance are on the road to the mountains. Fifty men are employed. The Thistle shaft is connected with that of the Old Go-ahead (snnk hy Messrs. Clough and Lowell two or more years ago) by a substantial tunnel 500 feet in length, affording a good airway and escape, besides extra accommodation for lowering timbers. A new main tunnel is being run on a higher level to tap the naw workings ahead. Supt. Wingate is abont to do away with the old workings. Tha water is easily handled and breasts are perfectly dry.

Siskiyou.

SALMON RIVER.—*Telegram*, Nov. 8: The Bogundez mine is taking out and milling about $700 daily. The Ball mine has closed down preparatory to selling for $500,000. We ara informed that Mr. Daggett is now running his mill on $200 rock. The gravel mines on the high points are paying very handsomely. Morgan and Patterson, who made tha recent discovery on Eddys' gulch, have taken out about $3000, and have a very fine ledge, which varies in width from six inches to three feet. The road from Etna to Sawyer's Bar is about completed, being the best mountain road in the county. The bridge across Russian creek is about completed.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Chronicle*, Nov. 3: 1100 level—There has been extracted from all parts of the mine during the week 962 290-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $29.06 psr ton. The average assav valne of all the ore worked at that mill during the week, 980 tons, was $25.43 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $18,593.02.

OPHIR.—1465 level—The east crosscut (opposite west crosscut No. 2) from the drift rnn south from the Mexican into tha Ophir ground, 101 feet below tha sill floor of this level, has been extended during the week 8 feet; total length 21 feet; in a quartz formation of low assay valne. From this east crosscut we have worked north and have extracted and raised to the surface 25 tons of ore, the average assay value of which is $21.50 per ton.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift, has been extended during tbe week 28 feet; total length west from the joint shaft 2586 feet; face is in clay and porphyry.

UTAH.—340 level—The nortb drift from west crosscut No. 2 has been extended 20 feet; total length, 150 feet, continuing in porphyry, clay and quartz formation.

SIERRA NEVADA.—The intermediate tnnnel between tbe Cedar Hill drift and Kenosha tunnel has been advanced 20 feet; total length 92 feet; face in soft porphyry. We have saved from tha Cedar Hill drift 12 tons of fair-grade ore. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 28 feet, making the total distance west of shaft 2586 feet; the face is in porphyry.

GOULD & CURAY.—200 level—The northwest drift, started 435 feet from shaft, has been ad-

vanced 18 feet through porphyry and clay; total length 532 feet. West crosscut No. 5 bas been extended 14 feet through porphyry, clay and quartz; total length 71 feet. On the Sutro tunnel level, the joint north drift with Savage Company has been advanced 25 feet during tbe week; total length, 655 feet; face in porphyry.

ANDES.—On the 420 level, north drift from end of east crosscut No. 1 north was advanced 22 feet; formation clay and porphyry.

BEST & BELCHER.—900 level—West crosscut No. 2 has been advanced 10 feet through soft porpbyry and stringers of quartz; total length, 45 feet; also did some repairing on this level during the past week.

HALE & NORCROSS.—1800 level—During the week advanced No. 1 west crosscut 17 feet; total length 110 feet; face in quertz and porphyry. Work has been suspended in No. 2 west crosscut. West crosscut No. 3 was advanced 12 feet; total length, 80 feet; face in quartz and porphyry. Have resumed work in main north drift of this level, which during the week has been advanced 12 feet, making its entire length 222 feet; face in porphyry.

CHOLLAR.—We are repairing the west drift, 350-foot level and north drift, 450-foot level. The east crosscut, 160 feet south of north line, 930 level, is out 196 feet; face in porphyry.

POTOSI.—Have connected southwest drift 1850 level, with northwest drift from Ward shaft, which affords a good circulation of air between the shafts. Extracted and sent to mill the past week 326 800-2000 tons of ore from the 550, 980, 1150 and 1300 levels. Milled during the week 325 tons. On hand at mill 55 tons. Average battery assay, $25.18. Average car sample assay, $28 37.

BULLION.—The west crosscut from north drift, from top of raise from east crosscut, 320 feet south of north line, 1300 level, is out 42 feet; face in pornhyry and quertz that gives low assays. The northwest drift from 1800 station, Ward shaft, bas a total length of 1034 feet. At that point connection was made with the southeast drift from the Potosi winze.

WARN SHAFT.—The joint Alpha and Exchequer east crosscut on 1800 level has been advanced during the week 25 feet; face in hard porpbyry. The joint Potosi and Bullion northwest drift, 1800 level, has a total length of 1034 feet. At this point connection was made with the southwest drift from the Potosi winze.

ALPHA.—The joint east crosscut on the north line of Alpha, 1800 level of Ward shaft, has a total length of 76 feet; face in porphyry.

EXCHEQUER.—The joint east crosscut on the north line of Alpha, 1800 level of Ward shaft, has a total length of 76 feet; face in porphyry

OCCIDENTAL.—From the stopes on 350, 400 and 450 levels we have extracted and milled 175 tons of ore of the average value of $18.20 per ton, as per battery samples. The Zadig drift, Sutro tunnel level, has been extended 24 feet; formation, soft porphyry.

NEW YORK.—Have resumed sinking the winze below the 650 level. It is now down 57 feet; bottom in low-grade quartz. Are taking out from 8 to 10 cars of ore per day, assaying from $20 to $30 per ton, from a two-foot streak above the 600 level. The west crosscut, 50 feet south of shaft, 650 level, is out six feet; face is in porphyry.

SILVER HILL.—Extracted and milled the past week 174 985-2000 tons of ore from the 160, 260 and 490 levels. Average battery assays, 16.46; average car-sample assays, $21.58.

Denver District.

STRIKES.—Grass Valley *Telegraph*, Nov. 5: C. C. Mandeville reports from Denver district, 30 miles south of Candelaria. He brings favorable reports from that section. Recently a number of strikes have been made going way up into the hundreds. A number of prospectors are in the district, and work on several promising claims is being done.

Kennedy District.

HIGH ASSAYS.—Grass Valley *Telegraph*, Nov. 5: C. C. Mandeville reports that in Kennedy district, in the East range, south of Winnemucca, ore is found that assays $120 to $140 a ton in gold.

Aurora District.

THE AURORA STRIKE.—Walker Lake *Bulletin*, Nov. 2: Work on the John Neidy mine in Aurora is progressing as fast as circumstances will permit. The ledge continues strong and the ore is improving right along. The ledge in the face is five feet between walls and there is three feet of pay ore, which averages about $35 per ton. There are now over 100 tons on the dump. The ore will be milled at the company's mill at Del Monte, and the returns will create great excitement in this vicinity. It is believed by old citizens of Aurora that this is equal to any of the big discoveries of former years, when that camp was the best bullion-producer in the State.

ARIZONA.

MOVING A MILL.—Mohave *Miner*, Nov. 5: W. D. McCright is moving his mill from Signal to the Groom's Peak country, where it will be erected and put to work on the rich ores of that place. There is a vast amount of ore in the vicinity of the new millsite too low in valnes to baul to the railroad that will pay handsomely in the mill. The famous Pittsburg mine in Chimebueva mountains has just been sold to Monaghan & Murphy of Needles, Cal. The purchase-price is unknown, but is understood to be up in the thousands. The mine, since its discovery, has been a heavy dividend-producer. The new owners will probably put on a large force of men and make large shipments of ore hereafter. Judge Schaefer has gone to White Hills to pay off his men. Since the sale of the big group of mines, the Judge has concluded to keep his present force of men at work on his individnal property, of which he has some of the best in that region. From now on we may look for renewed activity in mining in White Hills, as Judge Schaefer never does anything by halves. Thos. Gilbert went to Needles, Wednesday night, and from thence intends going to Gooff station, in company with two prospectors from the former place. They intend taking a complete prospecting outfit with them for the purpose of exploring the country in the vicinity of the recent gold discoveries, near Gooff, where Tom Gilbert is cognizant of several large gold ledges.

WHITE HILLS.—W. H. Hitchcock has gone to White Hills to pay off the men employed by himself and Sheriff Lake for some time past. Mr. Hitchcock has made a success of mining in the White Hills by using good judgment and by long experience in the mining regions of the West. Now that the mines are sold, he will undouhtedly turn his attention to this part of the county, where some really fine mines are known to exist. The new company will make many improvements in the method of working the mines at White Hills, as to work them successfully, machinery will have to be put on, boarding-houses and other buildings will have to be erected. There will be a hundred or more men put to work immediately in developing the properties and putting them in condition to stope out ore cheaply and easily. The purchasers of this large group of mines are successful Colorado mining-men, and they will make this venture a success in every sense of the term.

IDAHO.

A NEW SMELTER.—Idaho *Statesman*, Nov. 2: Judge J. W. Huston returned Monday from Mineral, where, in company with T. E. Logan, he has been making an inspection of the Black Hawk and Maria mines, belonging to the Maria Mining Company, in which both the gentlemen are heavy stockholders. Judge Huston reported the properties to be in excellent condition. But little work is being done at present, all the operations being brought to a temporary standstill by the recent burning of the Lang smelter. The judge said the work of constructing a new 80 ton smelter was being vigorously prosecuted, and that within four weeks it would be ready to handle the ores of the Black Hawk, Maria and other mines in the Mineral district. The smelter that was destroyed by fire was of but 30 tons capacity. At present there are only about 30 men employed in the camp, which force will be largely increased as soon as the new smelter is ready for business. The mines being worked in the Mineral district, besides those of the Maria Mining Company, are the Boom, Jeff Davis, Silver Bell and Egan.

WILLOW CREEK DISTRICT. — Anderson Cox arrived in the city yesterday from the Willow Creek district. He says the mines of that section are looking well. Locations are being made daily. Several large deals, involving some of the most valuable property in that district, are on foot, and will be consummated soon.

OREGON.

TO CORNUCOPIA.—Bedrock *Democrat*, Nov. 1: The breaking of the wire cable of the tramway of the Eastern Oregon Gold-Mining Company at Cornucopia, which occurred several weeks ago, thereby necessitating a suspension of operations of the mill, on account of being unable to get the ore from the Red Jacket mine to the mill, will soon be remedied, and operations will be going on in a few days as if nothing had happened. Yesterday six tons or more of wire arrived at the depot in this city from the East, and was at once loaded on teams and started for Cornucopia. The tramway will be repaired more durable than ever, and in a manner to withstand the heavy snows of winter. It is expected that the mine and mill of the E. O. G. M. Co. will be kept running without cessation from this time on.

NEAT CLEANUP.—The Hurdy Gurdy mine at Elkhorn mountain has surprised even the most sanguine expectations of its owners. Last evening Mr. N. S. Wight, the superintendent, arrived in town with a wad of bullion amounting to about $1400, the result of a little over four days' run with a Tremaine mill. This is a showing equal to the White Swan and will open the eyes of the Portland stockholders.

NEW MEXICO.

NOTES. — *Southwest Sentinel*, Nov. 1: The Bremen mill is running on ore from the Providentia mine in Chloride Flat. Bullion shipments have been resumed from the Maud S. mine at Silver creek. The alterations in the Peacock mill have been completed and work has been resumed on the mine. The new superintendent of the Jim Crow mine has commenced operations on the property. The company which purchased it recently will develop it thoroughly. The new shaft of the Solid Silver mine, at Black Hawk, is down about 60 feet. It is about 600 feet from the old shaft, and is being put down on an incline of about 70 degrees. It is not expected that the shaft will be completed before the end of next summer. A carload of very rich silver ore has been taken ont of the Alhambra mine at Black Hawk. The ore is as rich as that taken out of the mine by Miller & Dodd three years ago. The indications are that the mine will continue to produce very rich ore for some time to come. The Manhattan Gold-Mining and Milling Company's tunnel is now in over 600 feet. The manager expects to strike the main vein within the next 100 feet. The tunnel will strike the vein about 100 feet below the third level in the mine, and will give about 100 feet of stoping ground. The rock is very hard and progress in the tunnel is slow. The Brockman mill, at Lone mountain, cannot treat the ore which the mine can produce. The ore exists in such a large body that a few men could keep a mill of much larger capacity than the one now in operation going constantly. The ore-body is by odds the largest ever discovered in the Lone Mountain district, and will compare favorably with the largest ore-bodies in New Mexico.

SOUTH DAKOTA.

THE LARGEST YET.—Deadwood *Pioneer*, Nov. 2: The cleannp of the Golden Reward Chlorination Works for the last 15 days of October was completed yesterday with the exception of running it into a bar. The total amounts to nearly 1300 ounces, the largest amount yet produced by the plant in a like space of time, and the stockholders are correspondingly jubilant. The works are now treating 95 tons of ore every day and harrel No. 4 will be in place in a few days, which will increase the capacity to over 100 tons. The chlorination system was never worked under more satisfactory and encouraging results than at the Golden Reward, under the competent superintendency of M. Bamberger.

A PROMISING DISTRICT.—Deadwood *Pioneer*, Nov. 1: A district that bids fair to become a formidable rival to Bald Mountain and Ruby Basin is now receiving the attention of prospectors. It is in Two Bit, which has been worked in a desultory fashion for a number of years. Lately, men with money bave taken hold of some of the claims and have disclosed large bodies of refractory ore that is considerably higher grade than that found in the upper districts. Rus ell and Higby own 11 claims, upon which a body of ore seven feet thick bas been opened, which assays over $40 a ton in gold. Mining-men think that the proper contact bas been reached on these claims, and that intelligent prospecting will prove this as important as the most extensive district in the Hills.

WASHINGTON.

AROUND CONCONULLY.— Okanogan *Outlook*, Nov. 1: Harvey & Miller are doing development work on the Frankie Boy and other claims on Mineral hill for Nelson Clark, of Spokane. Jas. Robertson is working a force of men on the Lenora mine on Peacock hill. This is a fine large vein carrying a high-grade silver ore. The John Arthur mine was bonded last Saturday to a syndicate of eastern capitalists. The consideration bas not been made public, but we understand it is a good round sum. The sbaft on the Defiance mine, near Spectacle lake, is down 80 feet, and constantly improving. A force of eight men is employed on the mine, which is now owned by Everett parties, and Superintendent Pratt informs us that work will continue all winter. W. E. Hensley, one of the gentlemen who is interested in the Golden Fleece group of mines on Gold bill, passed through town yesterday en route to San Francisco, where he will spend the winter. Mr Hensley has been mining for 20 years, and thinks that the Golden Fleece is one of the most promising prospects he ever saw.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 18.		WEEK ENDING Oct. 25.		WEEK ENDING Nov. 2.		WEEK ENDING Nov. 9.	
Alpha	.30	.50	.25	....	.25	.30	.20	....
Alta	.30	.40	.25	.30	.20	.25	.20	.25
Andes	.50	.70	.40	.55	.40	.50	.40	.45
Belcher	3.10	3.95	2.40	2.85	2.20	2.50	1.55	.40
Belle Isle	.10	....	.10	....	.05	....	....	....
Best & Belcher	1.75	2.25	1.25	1.85	1.40	1.70	1.35	1.50
Bullion	.70	.90	.50	.70	.40	.5.	.30	.40
Bodie Con	.30	.40	.25	.30	.25	....	....	....
Bulwer	....	....	.30	....	....	....	.20	....
Commonwealth	....	....	....	....	....	....	....	....
Con. Va. & Cal	3.45	4.05	2 75	3.25	2.85	3.05	2 75	2.90
Challenge	.80	1.15	.50	.75	.55	.75	.50	.55
Chollar	.50	1 10	.50	.9.	.50	.80	.55	.70
Confidence	2.00	2.60	1.93	1.95	1.80	2.00	1.65	1.70
Con. Imperial	.05	....	.05	....	.05	....	....	....
Caledonia	.20	.25	.20	.25	.15	.20	.20	....
Crown Point	1.15	*1.40	1.15	1.40	1.25	1.50	1.05	1.40
Crocker	.10	....	....	....	....	....	....	....
Del Monte	.05	.10	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.20	.30	.15	.20	.10	.15	.10	....
Grand Prize	.10	....	....	....	....	....	....	....
Gould & Curry	1.15	1.40	.80	1.15	.80	1.10	.80	.90
Hale & Norcross	1.50	2.10	1.40	1.70	1.30	1.50	1.20	1.40
Julia	....	....	....	....	....	....	.15	....
Justice	.10	.25	.10	.15	.10	....	.10	....
Kentuck	.15	.25	.10	.15	.10	....	.15	....
Lady Wash	.15	.15	.10	....	....	....	....	....
Mono	.10	*.30	.25	.30	.25	....	.25	....
Mexican	1.50	1.85	1.15	1.40	1.25	1.45	1.20	1.40
Navajo	....	....	.15	....	....	....	....	....
North Belle Isle	.10	....	....	....	....	....	....	....
Nev. Queen	.10	....	....	....	....	....	.05	....
Occidental	.25	.30	.15	.20	.15	....	.10	....
Ophir	2.55	3.10	2.15	2.75	2.40	2.35	2.45	2.75
Overman	.55	.80	.45	.50	.30	.50	.30	*.50
Potosi	1.00	1.20	.85	1.30	.85	1.15	.85	.95
Peerless	.10	.15	....	....	....	....	....	....
Peer	.30	....	....	....	....	....	....	....
Savage	1.00	1.30	.75	1.00	.85	.85	.50	*1.20
S. B. & M	.50	.55	.35	.50	.30	.40	.25	.30
Sierra Nevada	1.50	2.05	1.25	1.50	1.10	1.35	1.10	1.30
Silver Hill	.15	.20	.10	.15	.10	....	.10	....
Scorpion	....	....	....	....	....	....	....	....
Union Con	1.25	1.55	1.10	1.30	1.10	1.30	1.00	1.10
Utah	1.20	1.30	1.15	1.20	1.15	1.25	1.10	1.20
Yellow Jacket	1.30	1.60	1.10	1.35	1.00	1 25	.85	1.10

*Assessment added.

Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Dr.	Cr.
ARIZONA MINES.		
Crocker	— —	2,559
Peer	— —	1,457
Peerless	— —	3,213
Silver King	— —	719
BODIE MINES.		
Bodie	— —	11,18
Bulwer	— —	11,085
Mono	— —	*3,159
Standard	— —	31,138
Summit	1,975	— —
Syndicate	— —	1,370
TUSCARORA MINES.		
Belle Isle	5,654	— —
Coptis	— —	4,000
Commonwealth	*30,178	— —
Del Monte	20,799	— —
Diana	248	— —
Grand Prize	— —	350
Independence	57	— —
Navajo	6,013	— —
Nevada Queen	14,3 9	— —
North Belle Isle	*10,757	— —
N. Commonwealth	1,655	— —
COMSTOCK MINES.		
Alpha	— —	7,662
Alta	— —	15,845
Andes	— —	5,410
Belcher	9,227	— —
Best & Belcher	— —	12,935
Bullion	*1,711	—
Caledonia	— —	3,486
Challenge	2,389	— —
Con. Imperial	5,115	— —
Con. Cal. & Va	12,387	— —
Con. New York	— —	1,752
Crown Point	— —	*2,487
East Sierra Nev.	— —	11
Exchequer	— —	*1,743
Gould & Curry	— —	1,109
Hale & Norcross	— —	17,395
Julia	— —	4,729
Justice	— —	—
Kentuck	— —	*31
Lady Washington	— —	5,351
Mexican	— —	*1,175
Occidental	*8,204	— —
Ophir	— —	5,674
Overman	*27,985	— —
Potosi	12 409	— —
Savage	*18,963	— —
Sco ption	— —	3,877
Sierra Nevada	— —	5,828
Seg. Belcher	1,907	— —
Silver Hill	— —	4,082
Union	— —	14,377
Utah	— —	90

*Collecting assessments.

NOTE.—Navajo has $4300 due on pumping account.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Nov. 10, 1892.

The week under review was largely interrupted by national and State elections, but now that the results are known, it is only a question of a few days before the country will settle down to its normal condition. There is no doubt but at the moment many bankers and financiers are borrowing trouble over the probable financial policy of the next administration. While this tends, for the time being, to promote a spirit of uneasiness which is calculated to foster a feeling of uncertainty, yet this will wear away, and by the time next Congress acts on the financial problem, its probable action will be largely discounted and no visible effect be discernible. This has been the history of all former financial legislation, and it is safe to say it will not differ in this case.

The local money market has moved along about the same as reported in our last review. Remittances from the interior have been fair, while the demand has been slow. There is an absence of speculation in all brenches of business, which tends to the accumulation of funds and to that spirit of caution which closely scrutinizes all propositions, however meritorious they may be. This spirit of conservatism is enforced by the uncertainty regarding the probable legislation on finance and also on the tariff by the 53d Congress, To this must be also added the near approach of the time for annual and semi-annual settlements. Banks and incorporated companies having funds out are drawing in more or less so as to provide for the disbursements which will be made during the first month in 1893, and to this can be traced much of the spirit of conservatism which pervades the market. The disbursements in this State next January, it is confidently expected, will be the largest within the history of this State, and until funds begin to find their way back to general financial reservoirs, the money market can be expected to work closely.

Eastern mail advices report continued activity in trade circles; not even the elections had any material effect. The increased and enlarging demands for manufactured goods are making themselves favorably felt, which would be felt more forcibly were it not for the elections, the near approach of the holiday season and the period for annual settlements. There does not appear to be any occasion for doubting that we have entered a new era of prosperity and that 1893 will witness more prosperous times than have obtained for several years. This opinion is well expressed by John H. Davis & Co., of New York, who rightly claim that there is no country on earth which presents to-day as many favorable factors in its business and financial condition as the United States. The crops of this year are abundant, and, owing to the unprecedented yield last year, the proceeds of this year's growth will not be used up in repairing deficiencies, but will give the producers a surplus for future uses. The railways of the Central States are clogged with wheat and corn, for lack of cars to move or warehouses in which to store the enormous tonnage offering. The statement comes from the Centrel markets that more than two-fifths as much wheat has come in sight already in this crop year as appeared in the entire crop year of 1891. The shipments of flour, grain and provisions from Chicago to the seaboard show a very large gain over the like time in last year. Our railways have an enormous traffic assured to them through the moving of the crops, the revival of the iron interest and the national activity which will prevail during all of 1893, by reason of the World's Fair in Chicago. The new railway construction for 1892 is likely to be less than for any other year since 1885. This is of double advantage—in the avoidance of a pressure of new securities for sale, and in giving to the existing lines the steadily increasing business of the country, which is gradually making hitherto unprofitable extensions self-sustaining. There is a growing and a gratifying purpose in the country to discourage unnecessary railway building, and also to require honesty in railway management. This demand for honesty in management appears to be extending to all incorporated companies, and when it is secured, then, and not until then, will the public operate as investors and not as gamblers, to which latter they have virtually been reduced by the high-handed course pursued by those in control.

SILVER—The market held to fairly steady prices up to yesterday (Wednesday), when there was a shading off in prices both in this country and abroad. To-day London telegraphs lower prices, as did New York. The decline is said to be due purely to manipulation and not to the result of the election. While saying this, it is quite generally conceded that Congress will repeal the present law which requires the purchasing of 4,500,000 ounces of silver bullion a month. From all we can learn, while it is generally believed the present silver law will be repeeled, yet it will depend largely on the action of the International Monetary Conference. There does not appear to be any reason for doubting that the Conference will

take favorable action looking to the more general introduction of silver as a metal currency, yet its action will not be binding, and until each country, provided the Conference acts favorable to bimetallism, ratifies the action of the Conference, silver will continue a stumbling-block and its market value fluctuate.

There was exported in bullion the past week to Japan $69,600.

MEXICAN DOLLARS—Exports by sea the past week aggregate $354,581 to China. The market has held fairly steady at around 68¾c.

QUICKSILVER—Receipts the past week aggregate 296 flasks. The market has held steady at pool prices.

BORAX—Receipts the past week aggregate 265 ctls, and exports by sea 4871 ctls to New York. The market has held steady, with no essential change in quotations reported.

LIME—Receipts the past week aggregate 2830 bbls. The market has been quiet at from $1.25 to $1.50 per bbl.

LEAD—The market has ruled barely steady. The demand is slow. Eastern advices indicate lower prices, owing to a selling pressure.

TIN—Plate shows more firmness, but pig is barely steady. English advices report a stronger demand from this country for plate.

PIG IRON—The market exhibits more strength, but any advance in sellers' views causes an offish feeling. The consumption continues only fair. Eastern mail advices report a firm market at another slight advance. English cables report a steady market.

COPPER—The market shows a fair degree of strength. English cables report a strong bear influence which causes a soft feeling. It looks as if the market is being shrewdly manipulated.

COAL—Imports the past week aggregate as follows: Coos Bay, 500 tons, Nanaimo, 1400; Tacoma, 6000; Seattle, 5412; Departure Bay, 2527; Newcastle, N. S. W., 2029. Total, 17,868 tons. The market does not show any material change, although for forward shipments stiff rates are asked. Importers are close students of the weather, and will govern themselves according to the prospects for plowing and seeding.

Mining Share Market.

SAN FRANCISCO, Nov. 10, 1892.

Mining shares the past week under review were not given any support by the mill rings, yet there were unmistakable signs that the inside bad their brokers taking in shares. Under such a dragging and slowly declining market outside, shareholders sold. By those in position to know, it is said that large lines of shares have been taken in by the inside, and as the points are still out "to let shares alone, they must go lower," very few of the shortsellers have filled, which, taken with what the bulls have sold, ought to give the rings all, if not more, of the shares that there are in several of the mines. If this is the case, there will soon be a reckoning for small short-sellers, and an attempt made to load up the public.

Operators should keep in view four very important facts, either of which, if ignored, is apt to cause financial losses. The points to be kept in view are: First, shares were never before so well concentrated, either by the mill rings or else by a strong money syndicate; second, reforms have been and are still being made in the extraction and milling of ore which are calculated to inure to the benefit of outside shareholders; third, the importance of the work which has been done; and, fourth, that much more work will, it is said by mining men, have to be done before some of the mines are in the best possible condition for economical working and being placed on a dividend-paying basis. This necessarily means large expenditures of money. Another thing should not be ignored, and that is, about all the important work in the Comstock mines is toward the West or Red lode, which is claimed by other companies, and that sooner or later litigation will be the order of the day. While suits at law may not be instituted for some time, yet they will surely come, for the owners of the west side mines will not sit idly by and see their ore extracted and milled by other companies. A concentration of shares by mill rings or a moneyed syndicate is *prima facie* evidence that a deal will be attempted so as to unload at a profit; and this being the case, it will necessitate, on the part of outside shareholders, the exercising of great caution so as not to be caught with shares when the market is advanced, for when top prices are reached there will be another decline of from 50 to 80 per cent—the former on shares which did not move up much and the latter on those which made the largest advance. How high the market will be advanced each patron must be the judge, but it is a safe proposition to sell when a profit is in sight and then keep out, for it is only a question of time when prices will go down, carrying the bulls with it.

Last July at the time when nearly every person was a bear, we predicted a deal, but warned outsiders of a break of from 60 to 80 per cent when top prices had been reached. Time proved us correct and time will again prove us correct in the assertion that when prices on the coming deal reach top, there will be a break of from 50 to 80 per cent. The break will come when the rings have sold all they possibly can and are forced to send prices down so as not to buy shares from large, moneyed short-sellers—it takes too much money to buy when the market is well up.

The share market opened this (Thursday) morning weak and inactive. After the regular Call there was a slight advance in the shares of the mines reported to be controlled by Mackay and Flood, under the lead of Hale & Norcross. From Chollar south there was no improvement, only a slightly steadier tone in sympathy with the advance in the shares of the former mine. The improvement in the shares of Mackay and Flood mines, is, no doubt, largely due to a rumor that these two gentlemen have secured the interest of Senator J. P. Jones and his brother Sam in the mills in which they were interested. While we are not in position to affirm or deny the report, yet we can unhesitatingly say that the change would give unqualified satisfaction. In saying this it must still be understood that we are of the opinion that there will not be a stable share market until the mills are turned over to the mining company, and all bullion produced given to the respective companies from which the ore was extracted. Until this is done, dealing in shares will be risky and a losing game to the person who waits for big things.

There appears to be a dearth of news from the Comstock mines. Even usually well-informed and reliable persons say that they have nothing new to report, and probably would not have until after the present week. This, they state, is due to the election taking precedence. From our own source of information we learn that very important work is under way in the three different groups of mines, and that a secret lightning drift is being run. Why this is kept secret and why it is being pushed with all the speed possible, it is hard to say, but it is safe to affirm that there is some kind of scheme back of it. The west crosscuts which are being run in Hale & Norcross and several other mines are expected to run into good milling ore within the next two weeks. Profound ignorance is manifested regarding the work in Belcher, Crown Point and Yellow Jacket. Probably this is done to induce buying, for if good news was given out the public would "cappper" it, as experience has made operators doubting Thomases. The car sample assays reported the past week, show an increase in value. Con. Virginia's monthly statement shows a very large proportion (about 75 per cent) of gold. Other bullion-producing mines are said to be showing a steady increase in the percentage of gold.

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	— @	13½	
BORAX.			
Refined, in car lots	— @	7½	
Powdered, do	— @	7½	
Concentrat'd, do	— @	6¾	
All grades jobbing at advance.			
COPPER.			
Bolt	22 @	—	
Sheathing	22 @	—	
Ingot, jobbing	— @	14½	
Do, wholesale	— @	13½	
Fire Box Sheets	22 @	24	
IRON.			
Bar, base	— @	3	
Norway, base	— @	4½	
PIG IRON.			
	Spot.		
Eglinton ₩ ton	22 00@	—	
Glengarnock	23 00 @	—	
Am. Soft, No. 1	24 00@	—	
Oregon Pig	— @	—	
Puget Sound	— @	—	
Olay Lane White	24 00@	—	
Langloan	22 00@	—	
Thornoliffe	23 00@	—	
Gartcherrie	22 00@	—	
Barrow	22 00@	—	
Cargoffoot	22 00@	—	
CHROME IRON ORE.			
Per ton	10 00 @	—	
LEAD.			
Pig	— @	4½	
Bar	— @	5½	
Sheet	— @	7	
Pipe	— @	6¾	
SHOT.			
Drop, sizes *smaller* than B, ₩ keg of 25 lbs		$1 85	
Do do, B and *la gerizes* ₩ bag of 25 lbs		2 10	
Buck, Balls and Chilled do, ₩ bag of 25 lbs		2 10	
QUICKSILVER.			
Home trade, per flask		$41 50 @42 00	
For export		35 50 @36 00	

STEEL.			
English, lb	— @	18	
Canton tool	— @	8¼	
Sil'k Diam'd tool	8¾@	15	
Pick & Hammer	4¼ @	10	
Machinery	4 @	5	
Toe Calk	— @	4¼	
TINPLATE.			
B. V. steel grade			
14x20, spot	— @	5 87½	
Charcoal, 14x20	— @	5 87½	
Do roofing, 14x20	— @	5 87½	
Do, do, 20x28	— @	11 75	
PIG TIN.			
Spot ₩ lb	— @	23	
COAL.			
SPOT FROM ARR—PER TON			
Wellington		$8 00	
Greta		7 50	
Nanaimo		6 50	
Gilman		6 00	
Seattle		6 00	
Coos Bay		5 50	
Cannel		8 50	
Egg hard		12 00	
Cumberland, in sacks		15 50	
Do, bulk		14 00	
Wallsend		7 25	
Scotch Splint		7 50	
Brymbo		7 50	
West Hartley		7 50	
TO LOAD—PER TON.			
Australian	6 00@	—	
Liverpool Steam	6 25@	—	
Scotch Splint	5 25@	—	
Cardiff	6 50 @	—	
Lehigh Lump	15 00@	—	
Cumberland	13 00 @	—	
Egg hard	11 00@	—	
West Hartley	7 00@	—	
COKE.			
English, to load	$8 00@	9 00	
Do, spot, in bulk	— @	10 00	
Do, in sacks	— @	12 00	
Cumberland	9 00@	—	

Eastern Metal Markets.

NEW YORK, Nov. 9.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38 15-16	81½	11 65	3 80	20 70
Friday	39 1-16	83¼	11 65	3 80	20 70
Saturday	39½	8 3	11 65	3 85	20 70
Monday	39 1-15	85½	11 65	3 90	20 70
Tuesday	39 1-16	....	....	....	....
Wednesday	38⅞	84½	11 55	3 80	20 60

Quicksilver is steady. Pig tin is dull and heavy, but plate is firm. Lead is weak. Copper is inactive but steady. Pig iron is firm.

SACRAMENTO ELECTRIC POWER COMPANY—Capital stock, $1,500,000. Directors—Albert Gallatin, A. J. Ralston, Horatio P. Livermore, Charles E. Livermore and Joshua Barker. The company proposes to furnish light and power to the inhabitants of Sacramento, and also to construct a street railroad to run from the passenger depot of the Southern Pacific Company to the eastern boundary of the city. The estimated length is 16 miles.

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ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY
Belle Isle M Co, Nev	5	10c	Nov 5, D c 7, Jan 4		J W Pew, 310 Pine
Brunswick Cons G M Co, California	4	2c	Sept 29, Oct 31, Nov 17		J Stadfeld Jr, 309 Montgomery
Bullion M Co., Nevada	4	2½c	Oct 20, N v 24, Dec 14		R R Grayson, 31 Pine
Carra M & M Co			Sept 28, Nov 3, Dec 28		O U Coleman, 16 Fremont
Cons New York M Co, Nevada	9	1½c	Nov 7, Dec 5, Dec 28		C E Elliott, 309 Montgomery
Cons Pacific M Co, California	14	10c	Sept 29, Nov 5, Nov 30		F E Luty, 30 Pine
Cons St. Gothard M Co, California	6	5c	Oct 13, Nov 17, Dec 7		T Wetzel, 320 Sansome
Eureka C n Drift M Co, California	5	0c	Sept 19, Oct 24, N v 14		D M Ken, 330 Pine
Ev ning Star M Co, California	6	2c	Oct 10, Nov 1, Nov 19		J J Scoville, 320 Sansome
Exchequer M Co, Nevada	34	10c	Oct 28, Nov 30, Dec 26		C E Elliott, 309 Montgomery
Golden Fleece Gravel M Co, Calif'rnia	18	3c	Oct 10, Nov 16, Dec 7		W J Gleason, Pine an Block
Gray Eagle M Co, California	30	6c	Sept 28, Oct 31, Nov 21		A W Burrows, 343 California
Inyo Mar le Co, California	18	50c	Sept 2, Oct 22, Dec 1		A F Thane, 137 Montgomery
Justice M Co, Nevada	54	1c	Oct 14, Nov 18, Dec 8		R E Kelley, 419 California
Kentu k Cons M Co, Nevada	5	10c	Oct 3, Nov 8, Nov 23		J W P w, 310 Pine
Keyes & M Co, Nevada	5	25c	Nov 2, Dec 6, Dec 27		J H Sayre, 323 Montgomery
Meadow M Co, Nevada	46	25c	Oct 13, Nov 17, Dec 7		C E Elliott, 309 Montgomery
Mono M Co, California	32	75c	Sept 15, Oct 24, Nov 14		H D Wake, 3 9 Montgomery
Occidental Cons M Co, Nevada	11	2½c	Oct 25, Nov 3, Dec 21		A K Durbrow, 309 Montgomery
Overman M Co, Nevada	65	3½c	Oct 5, Nov 10, Nov 0		G D Edwards, 414 California
Savage M Co, Nevada	79	10c	Oct 7, Nov 8, Nov 29		E B Holmes, 309 Montgomery
Sierra Nevada S M Co, Nev	103	25c	Nov 8, Dec 14, Jan 3		E L Parker, 309 Montgomery
South Eureka M Co, Cal	1	2c	Nov 2, Dec 9, Dec 31		A Hal ey, 328 Montgomery
Ter sa M Co, Mexico	9	10c	Oct 25, Nov 29, Dec 16		K J Wi'ats, 307 Market
White Mountains M Co, California	2	1c	Oct 13, Nov 22, Dec 12		S K Nichols, 320 Sansome
Yellow Jacket M Co, Nevada	52	25c	Sept 5, Oct 7, Nov 11		W H Blauvelt, 331 Pine

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
East Bear and Belcher M Co, Nevada	Annual	O H Mason, 324½ Montgomery	Nov 23
North Gould and Curry M Co, Nevada	Annual	O H Mason, 324½ Montgomery	Nov 21
Occidental M Co, Nevada	Annual	A K Durbrow, 309 Montgomery	Nov 21
Oneida M Co, California	Annual	A K Durbrow, 309 Montgomery	Sept 19
Silver Lick Cons M Co, Nev	Annual	W Ladd, 531 California	Nov 15
Summit G M Co, Cal	Annual	M E Willis, 309 Montgomery	Nov 21

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	5	L Osb rne, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzel, 310 Pine	Nov 1
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Oct 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 25

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOV. 1, 1892.

485,526.—CARBURETOR—Dan'l Best, San Leandro, Cal.

485,530.—BOX-NAILER—Jas. A. Cain, Markham, Cal.

485,178.—SURGICAL SPLINT — E. Densmore, Coronado, Cal.

485,497.—AXLE-NUT—John Gambetta, Stockton, Cal.

485,345.—ICE VELOCIPEDE — M. B. Gibson, Ukiah, Cal.

485,193.—DREDGING IMPLEMENT—John Hatch, S. F.

485,582.—FISHING FLY-HOOK — D. K. Howe, Portland, Ogn.

485,596.—WATER-WHEEL—C. W. Huson, Nevada City, Cal.

485,501.—ORE-FEEDER—E. A. Langford, Grass Valley, Cal.

485,421.—GOPHER-TRAP—Geo. Moor, Lafayette, Ogn.

485,213.—JOURNAL-BOX — J. Q. Nyquist, Tacoma, Wash.

485,477.—WATER-WHEEL BUCKET—J. B. Pitchford S. F.

485,562.—RAILWAY CAR—T. E. Pope, Oakland, Cal.

485,428 —CONCRETE-MIXER — E. L. Ransome, Oakland, Cal.

485,430.—FAUCET—W.W. Riner, Los Angeles, Cal.

485,237.—CABLE-GRIP — P. T. Taylor, S. F.

485,242.—PIPE-MAKING MACHINE—W. A. Tipson, S. F.

485,517.—ROCK-CRUSHER—G. W. Weller, Baker City, Ogn.

21,952.—DESIGN FOR SPOON—Bates & Quimby, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GAS-ENGINE MOTOR FOR CARS.—Daniel Best San Leandro. No. 484,728. Dated Oct. 18 1892. This invention relates to a gas-motor which is adapted especially to drive cars. It consists of two oppositely placed cylinders, the connecting-rods from the pistons of which act upon the same crank. Intermediate gears and pinions transmit the power of the engine-shaft to the car-axles and enable the operator to reverse the travel of the car and make it run in either direction, without reversing the engine. A peculiar frictional clutch allows the driving mechanism to be connected with or disconnected from the car, and the power to be applied gradually. A novel means for supplying the gasoline vapor to the engines is employed, and the exhaust is led above the roof and muffled so that there is little or no noise and no odor.

MANUAL CASH RECORDER—Hermann Kiehl of Halle-on-the-Salle, Germany, assignor to Jesse Meye field, S. F. No. 484,742. Dated Oct. 18, 1892. This is one of that class of cash-recorders in which a moving paper, upon which the amounts received are to be written, is employed as a check and confirmation of the amounts deposited in the receiver. It consists in a box having within it a tilting tray adapted to receive the money and observable through a sight aperture in the box and mechanism within the box operated by a handle or lever from without for tilting the tray. The invention consists also, in connection with the box, of a movable strip of paper mounted therein and observable, and its surface accessible from without, a tilting-tray within the box observable through a sight-aperture, an opening by which the money is passed to the tray, and a suitable mechanism for tilting the tray and advancing the paper. The object is to provide a cash-recorder in which the coin or other money deposited in the receiver shall lie temporarily in full sight of the customer, and in which a check or confirmation is provided by means of the traveling paper upon which the clerk is required to write the amount which he has deposited in the tray.

FEEDER FOR BALING-PRESSES—John H. Kruse and Milton K. Shipley, Oswego, Or. No. 485,045. Dated Oct. 25, 1892. The invention relates to that class of feeding mechanisms for baling-presses and other machines in which movable rake-arms are employed to engage and advance the material. It consists in the novel construction and arrangement of the rake-arms, the novel mechanism for operating them, and the table in connection with which they operate. The object is to provide a simple and effective mechanism especially adapted for feeding material to baling-presses, but also useful in connection with the supplying of material to other machines.

EXCAVATOR.—Henry P. Bennett, Phœnix, A. T., assignor of one-half to S. C. Symonds. No. 485,084. Dated Oct. 25, 1892. This excavating or ditching machine consists essentially in a plow, a rotating-wheel provided with elevating-buckets, which receive the material from the plow and carry it upwardly, and a swinging or vibrating discharge-shovel to receive the material from the elevating-buckets and throw it to one side.

BITUMINOUS-ROCK-REDUCING MACHINE.—Samuel P. Hall and James W. Wood, Oakland. No. 484 735. Dated Oct. 18, 1892. This is a machine which is especially designed for pulverizing and preparing bituminous rock to be used upon streets and roadways and for the preparation of surfaces generally. The object of the invention is to provide an apparatus in which asphaltum in lumps is prepared and finally reduced, crumbled and pulverized to a sufficient fineness to be employed on streets, etc.

GAS ENGINE.—Daniel Best, San Leandro. No. 487,727. Dated Oct. 18. 1892. The invention relates to certain improvements in engines which are propelled by the explosion of an inflammable vapor or gas, and in which the piston moving in the engine-cylinder first serves as a pump to draw a charge of the explosive gas or vapor into the cylinder, and after returning to compress the vapor in the end of the cylinder is again propelled to the opposite end of the stroke by the ignition and explosion of the confined vapor. The patent covers certain details of construction, especially in the igniting device and the valves. The speed of the engine may be regulated with great nicety, so that it runs very steadily. As to the igniting device, it has been found that the best results of a gas engine are produced when the explosive mixture is ignited at the instant of greatest compression, and as the crank passes the center nearest the cylinder and the piston is ready for the outward stroke. If the piston starts on its stroke before the ignition, the compression is reduced and loss of energy is observable. The construction devised by Mr. Best is such that no amount of longitudinal extension or contraction by heat of the electrical ignition will alter the time of making the spark and the explosion of the charge.

Testing and Working Silver Ores

A VALUABLE BOOK.

An illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope.

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Ohilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings, and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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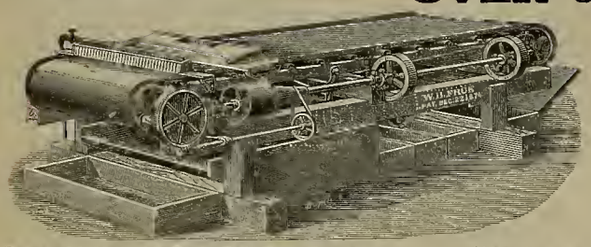

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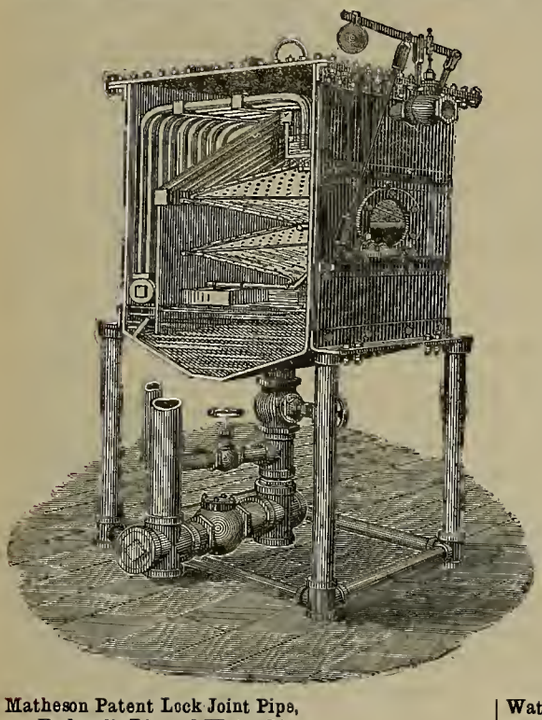

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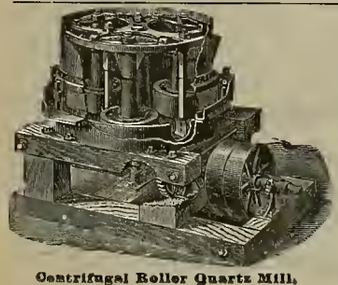

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VOL. LXV.—Number 21.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, NOVEMBER 19, 1892.

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The Caminetti Hydraulic Mining Bill.

The resolutions adopted by the State Mining Convention indorsing the Caminetti bill need little explanation. Only two amendments are suggested. One is to expurge the word "must," put in by Senator Felton, and substitute the word "may," as contained in the original bill. The object of this is to leave out such hydraulic miners as can carry on work without the interference or assistance of the U. S. Engineers. The bill as it stands provides that those who want to hydraulic *may* file with the Government Commission a verified petition to mine. Senator Felton wants the bill to say they *must*. This would make the hydraulic miners in Trinity and Siskiyou counties come under the provisions of this law, which is not necessary, and which they naturally object to. Their debris tails now into the Klamath — a non-navigable stream—and so into the ocean, injuring no rivers or farming lands.

Again, in other places, mines are being worked which do no injury, and which have never been enjoined. Unless the word *must* is kept out of the bill, all these people will be brought under its operation.

The proviso sought to be added is: "Provided, that this act shall not be so construed as to prohibit the carrying on of any mining operations prior to the construction of said dams which can be conducted without material injury to the navigable streams of the State or lands adjacent to said streams." The object of this is plain enough; not to stop men from mining who can now do it without injury.

It is recommended that an appropriation for building the dams be asked for. This would come in due time, probably, if the bill passed both houses, since it would be necessary to make the act operative.

The resolutions with reference to this bill, adopted by the Resolution Committee, were also adopted without opposition by the convention. There was not a voice raised against them. But later in the day a motion to reconsider the subject was made, which gave rise to rather an acrimonious debate.

The matter was finally settled, however, as originally proposed, by refusing to reconsider the resolution. The opposition to the bill was on the part of a few miners only, but they were vigorous and earnest in the matter. The great bulk of the members of the convention, however, were in favor of the bill as the best that could be obtained. They all recognize that it is not exactly what they want, or even what Mr. Caminetti himself wants, but there is no chance of getting anything better for the miner. When the ayes and noes were called for on the motion to reconsider, there was such a shout of "no" that there was no use in calling the roll. The bill was endorsed by the convention by a practically unanimous vote.

The Miners' Association Banquet.

In the evening, after the adjournment of the Miners' Convention, the delegates met in the Maple room of the Palace Hotel at a banquet. Mr. Neff presided and Louis Glass acted as toastmaster of the evening. The toasts were as follows: "The President of the United States," by John F. Davis; "The Governor of California," by State Mineralogist Wm. Irelan Jr.; "The California Miners' Association," by Alf. Tregidgo; "Hydraulic Mining," by Senator-elect T. E. Ford; "The Judiciary," by C. W. Cross; "Mining Department of the University of California," by Prof. S. B. Christy; "The MINING AND SCIENTIFIC PRESS," by Chas. G. Yale; "City of San Francisco," by Judge J. A. Waymire; "Electricity, the Coming Power," by Prof. N. S. Keith; "The Ladies," by D. D. Bowman; "The Press," by E. B. Price (of the Oroville *Mercury*); "The County Miners' Associations," by W. G. Hodson (of Shasta).

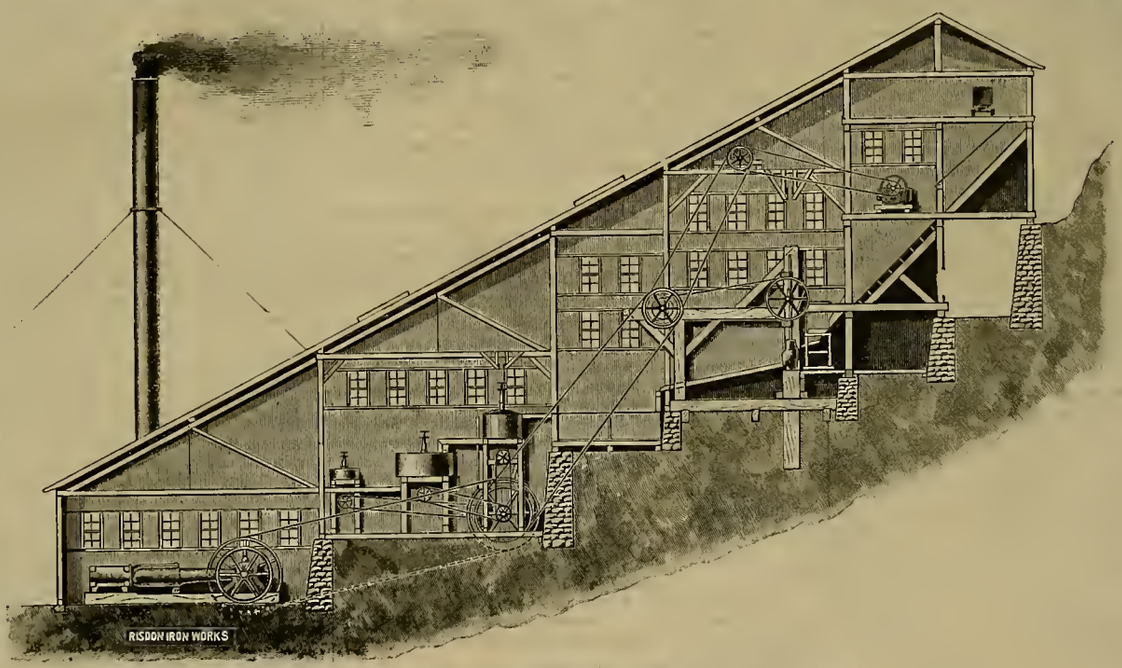
The speech of Mr. Davis, in responding to the first toast of the evening, was a particularly happy one, well delivered. Mr. Ford delighted his friends by his eloquent remarks; and Mr. Cross brought encouragement to miners by what he said about the judiciary. At the close of Mr. Fredidjo's address, after referring to the secretary of the association, he proposed a toast to the memory of W. C. Ralston, which was drunk standing.

The MINING AND SCIENTIFIC PRESS was complimented by being called as one of the regular toasts, and spoken of as the steadfast friend of the miner and the mining interests. The editors and publishers are pleased to note this mark of appreciation.

IT IS announced that the principal mine in the White Hills, A. T., has been sold to R. T. Root and C. W. Barry of Denver for $250,000. Judge Henry Schaefer gets two-thirds of this and the remainder goes to Wm. B. Lake.

Wet-Crushing Silver Mill.

Free-milling silver ores pass through the same process as gold ores, until the battery is reached. Then the amalgamating plates of the gold mill are omitted, and the pulp flows from the batteries in sluice boxes to the settling tanks, usually arranged in rows between the batteries and pans. Various sizes and patterns of pans are used for grinding and amalgamating, usually one 5-foot pan for two stamps. These pans are arranged in a row, allowing a narrow platform between them and the settling tanks. The settlers are located immediately in front of and about four feet lower than the pans; one settler to two pans. The capacity of a 5-foot pan is from 2000 to 3000 pounds per charge, and each charge requires four to five hours treatment in the pans. When the pan is charged, water is added to reduce the pulp to the proper consistency, the chemicals are then added, the muller lowered, and the grinding takes place during the first two hours. The muller is then raised and the quicksilver added, changing the pan from the grinding to the amalgamating period. Amalgamation then continues for three hours. The pans are usually provided with steam chambers, where either live or exhaust steam is used to heat the charge to the proper temperature, which must not be so great as to vaporize the quicksilver.



SIXTY STAMP WET-CRUSHING SILVER MILL, TANK SYSTEM.

When the time to draw off the amalgamated pan charge arrives, an empty settler is ready to receive it. The charge flows to the settler, which is much larger than the pan. Enough cold water is added to fill the settler, thus reducing and cooling the thick hot pulp to the condition best adapted to settling. The speed of the settler is so regulated that the pulp is barely held in suspense, while the greater specific gravity of the amalgam causes it to settle to the bottom, where it remains until drawn off at the pleasure of the amalgamator. The settling of a charge is accomplished in half the time it requires in the pan, consequently one settler serves for two pans. After settling is complete, the charge is drawn off at the series of discharge nozzles, commencing at the upper one and continuing downward as the charge recedes, always leaving the portion containing the amalgam in the settler. The amalgam is then strained, the quicksilver is elevated to the pans, and the amalgam retorted.

The water flowing from the settling tanks frequently carries slimes with it, which are often valuable, in which case they are settled in reservoirs, dried and amalgamated separately.

The cut on this page shows a sixty stamp wet-crushing silver mill, on the tank system, as planned by the Risdon Iron Works, of this city.

MINING AND SCIENTIFIC PRESS.

BY THE DEWEY PUBLISHING CO.

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W. B. EWER, }
CHAS. G. YALE, } ..... EDITORS

ALFRED HOLMAN ..... MANAGER

Entered at the S. F. Postoffice as Second-Class Mail Matter.

Our latest forms go to press on Thursday evening.

San Francisco, November 19, 1892.

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Where the Money Went.

Upward of $14,000 was collected by miners after the formation of the State Miners' Association, for the purpose of furthering their interests. This money was contributed by firms and individuals. The main necessity was to send a delegation to Washington to urge the passage of measures which would permit the resumption of hydraulic mining in this State. Most of the money was spent in this direction. It will be necessary, doubtless, to send some one to Washington during the coming session of Congress to guard the interests of the miners, until the final passage hy both Houses of the pending bill. Where the money came from and how it was spent is shown by the following financial etatement of Secretary Ralston:

RECEIPTS.

San Francisco county	$7,405 33
Nevada county	2,450 00
Placer county	2,002 00
El Dorado county	450 00
Trinity county	250 00
Shasta county	200 00
Plumas county	232 50
Yuba county	555 00
Sierra county	700 00
Amador county	82 50
Butte county	200 00
Total	$14,522 33

EXPENDITURES.

Office rent account	$ 376 10	
Salary account, office sundries	1,080 67	
Stationery, stamps, etc	228 28	
Office fixtures, desk, etc	284 20	
Printing certificates, typewriting	331 37	
Miscellaneous expenses	557 30	
		$2,857 92

EXPENSES OF DELEGATION TO WASHINGTON.

J. K. Luttrell	$3,888 80	
J. B. Hobson	3,207 40	
Niles Searles	2,535 40	
R. McMurray	1,000 00	
Miscellaneous expenses, telegrams, etc	697 67	
		$11,329 27
San Francisco County Miners' Association		150 00
Cash in hank		185 14
Total		$14,522 33

MR. GEO. OHLEYER, the great antidebris agitator, who wanted to be elected to the Legislature so as to prevent the miners obtaining any recognition in that body, w as defeated in his district. There is a change in public sentiment on this subject, as Mr. Ohleyer has now doubtless discovered.

THERE were more representative miners of California in San Francisco this week than have been seen since the convention of last January. They came from all the mining counties, and were glad of the opportunity to meet each other and discuss the mining situation.

CONGRESSMAN GEARY, who has been reelected to Congress, is friendly to the mining intereats and an influential member of the California delegation.

AT the last meeting of the supervisors five street-railroad franchises were asked for.

Proceedings of the Miners' Convention.

What was Done by the Miners During Two Days Session.

The State Miners' Convention was called to order in Pioneer hall on Tuesday afternoon hy J. H. Neff, president of the State Miners' Association. The hall was well filled, but there were not as many delegates present as on the occasion of the convention in January last. The valley counties were not represented this time, although invitations had been extended for delegations from those counties. Under the rules of the association, each county organization is entitled to one delegate to the convention for each ten members. This naturally cut the delegations down numerically, since on the former occasion there was practically no limit. Nevada county sent the largest delegation this year, but Sierra and Placer showed up well also. The lists of delegates are given in another column.

Chairman Neff, on calling the convention to order, explained that, while the constitution provided for the convention in October, the executive committee had deemed it prudent to postpone until after the election, so that politics might be kept out of the deliherations. He then explained that the last convention selected five gentlemen to see and if possible instruct our representatives in Congress on the issues so vital to us and to California. This movement proved to be a good one. They carried on a campaign of education, for there was much ignorance on the subject and much prejudice to disperse. The matter required the constant time and labor of the delegates, and finally a bill was passed ih the lower House, for which thanks are due to those who supported it. Now there is a bill pending in the United States Senate. A copy of this bill would be referred to the committee on resolutions, whose members were to deliberate whether the bill will be for the real interests of the mining industry or not. Mr. Neff reminded the convention "that this campaign is not a campaign against our neighbors of the valley. If hydraulic mining is against the agricultural interests, it should not be fostered to that extent. We think that it is not, and that there is a way and means by which right and justice can be done to both. We think that there is sufficient skill in the engineering departments of the country to solve the momentous questions and issues involved."

The preliminaries of business were soon arranged, and the necessary committees on credentials, resolutions, ways and means, etc., appointed. These will be found elsewhere in this number of the PRESS. As they were about to adjourn, it was found that Senator Stewart of Nevada, who had been invited, was in the hall, and he was led to the platform by Chairman Neff and addressed the convention. He concluded by directing attention to the silver question, using the arguments which have from time to time been published from his utterances in the Senate.

At the conclusion of Senator Stewart's address, Senator Meade of Sierra county suggested that it was important to know something about probable State legislation. The miners should know what kind of legislation it was proposed to have at the next session, for the State legislation was just as important as the national. The speaker said that he for one would like to hear from the members-elect to the Legislature about their position on the mining question and what they proposed to do. If they had not formulated any opinions the convention would assist them.

This idea was not very well received by the convention, and after a brief but earnest speech opposing it hy Judge Searles the subject was dropped as savoring of "politics."

The chairman, seeing Congressman Caminetti in the audience, asked him to address the convention. Congressman Caminetti responded with a few remarks, stating that he was ill and his family was sick, which fact would prevent him from participating in the deliberations of the convention. He said he had tried to do the best he could for the miners at the last session of Congress, believing that his course represented the opinions of his constituents. He notified the members that he had nothing to suggest and nothing to dictate on the suhject, but would do everything to profit by the result of their deliberations. He would devote all of his time and energies toward solving the momentous question. Congressman Caminetti also said that he had been delegated by a Congressional committee to investigate the suhject of titles to lands in mining districts and also to those lands comprehended under tbe railroad grants. He hoped the convention would investigate the subject, as much depended on it for the people.

Among other things, Mr. Caminetti said: "I am here as your servant to obey your instructions and do all in my power to assist in the interests of the people of California, and to rehabilitate the hydraulic-mining industry if it can he done without injury to any other interest. I do not claim that my bill is perfect. It is the best that could be done under the circumstances. I do not think the people of the Second District reelected me because my name is Caminetti, but that they elected it was best to send me back to Washington. I shall dedicate all my time and efforts to seeking a solution of this important mining question, protecting them all and recognizing every interest on the same basis of eqality."

At the conclusion of his address, the convention complimented tbe speaker by giving him three hearty cheers.

Adjournment was then taken until 10 A. M. Wednesday.

The headquarters of the State Mining Association having been established in the reception-room of the Palace Hotel, most of the delegates assembled there in the evening. Arrangements had been made to serenade Senator Stewart and Congressman elect Frank G. Newlands of Nevada. The miners gathered in the court of the Palace, and after the serenade, listened to speeches hy these gentlemen. They related mainly to silver and silver mining.

The committees appointed during the session of the convention met during the evening, and some of them continued their labors far into the morning hours. This was particularly the case with the committee on resolutions. What they accomplished is shown in the resolutions, afterward adopted hy the convention, and published on another page.

At 10 A M. on Wednesday the second day's session commenced. The first report presented was from the committee on credentials, of which Major McBride of Sierra was chairman. There had been no contests, and every delegate in the city was deemed entitled to a seat. The list is given in another column. The secretary reported the membership of the association as follows: Alameda, 41; Butte, 200; Calaveras, 85; El Dorado, 270; Mono, 38; Plumas, 250; Shasta, 104; Sierra, 500; Siskiyou, 100; Yuba, 150; San Francisco, 315; Amador, 247; Nevada, 1200; Placer, 1000. Total, 4378. These figures show the strength of the respective county organizations, which combined give that of the State association.

Messrs. Ross E. Browne, Chas. G Yale, John Hays Hammond, Chas. F. Hoffman and J. F. Gourley had prepared a statement of the grievances of the drift mines of the State, and submitted it to the Committee on Resolutions in the form of a memorial to Congress. This was done in order to give the subject distinct prominence, and the committee was asked to permit it to come before the convention in that form. This request was agreed to, and the memorial was adopted hy the convention on recommendation of the Committee on Resolutions. It is published in full on another page. The object of this memorial is to call the attention of Congress to the difficulties of obtaining patent to drift-mining ground under present ridiculous rulings of the Land Office and Department of the Interior. This is a hranch of mining not recognized in the laws, and the general laws as they stand are such as to discourage drift-mining and hamper all engaged in it. The convention unanimously indorsed the memorial and ordered it forwarded to Washington to be presented to Congress by the California representatives.

The resolutions reported by the committee, as printed in another column, are very brief. They reaffirm those adopted by the last convention, which relate principally to the hydraulic mining question. The resolutions approve of free silver; indorse the work and purposes of the State Mining Bureau; call for further work on the State Geological map; and ask for more copies of the State report on auriferous gravels. The main resolutions were those endorsing the Caminetti bill, which has passed the lower House of Congress and is pending in the Senate with certain proposed amendments by Senator Felton. The resolutions also recommend the State to assist in the construction of such debris-impounding works as are recommended by the United States Engineers. A very important one is that relating to the determination of the mineral or nonmineral character of lands, and asking legislation on the suhject. This really took the place of a strong antirailroad resolution which had been offered before the Caminetti, and serves the purpose just as well.

It is well known that under present rulings of the Departments, large tracts of land known to be mineral in character have passed to the railroad. The matter is pending in the courts now, on several cases, hut there is always more or less trouble. Meantime, land is gradually being absorbed by the corporations, which should really belong to the prospectors' domain. This is a hard question for the miners to handle, but they are going to make an effort to have the Government officially determine the character of these lands, so as to stop further depredations on mineral ground. It was not, however, desired to antagonize the powerful railroad influence, and the resolution relating to this subject was drawn as printed.

In this connection, it may be stated that at a subsequent stage of the proceedings the chairman appointed a committee on legislation to consider subjects relating to the mining laws as they affect California, with a view of bringing to the attention of Congress tbe defects discovered hy experience. This committee consists of C. W. Cross, Ross E. Browne, Edward Coleman, John Hays Hammond and Charles G. Yale.

The resolution relating to the Caminetti bill and proposed amendments is commented upon more at length in a separate article in this number of the PRESS. It passed the convention without opposition in the morning, but just before adjournment Major McBride of Nevada couhty arose and said that there were some things in the Caminetti hill which were objectionable to him, and be disapproved of the resolutions brought in by the special committee and adopted at the morning session. The result of this was that for a time it seemed that the harmony formerly prevailing would he disturbed. The subject was discussed by J. K. Luttrell, Niles Searles, C. W. Cross and others in in favor of the bill, and J. W. McBride, Robert McMurray, J. M. Fulweiler and others against it. Judge Walling of Nevada, Judge Dibble, Mr. Spencer of Siskiyou and others wanted the matter referred to the executive committee with power to act. There was a long and somewhat heated discussion on the question of reconsideration of the favoring resolution, but the convention in the end refused to reconsider, and the resolution to indorse the bill stands.

The opposition to the measure had no real strength. A dozen or so men were decidedly opposed to the bill and wanted something better. In fact, they all wanted something better but by far the greater majority knew this was the best that could be obtained and was willing to accept it. The best advice of the members of Congress had been taken and the friends of the California miner had advised the acceptance of this measure. To have refused indorsement of the hill would have placed the dele-

gatinn to Congress and the Miners' Executive Committee in an awkward position, as having urged the passage of a measure opposed to the interests of the miner.

Before this discussion on the question of reconsideration came up, Congressman Geary was called to the platform and made a short but direct and earnest speech. He said nothing against the Caminetti hill—did not mention it in fact, but the inference from his remarks was that a simpler one was needed. After some general remarks, he said: "But to come to the practical part of my talk, and the part in which you are most interested in. Now, you want legislation from Congress. We Californians are an enthusiastic crowd. We go in on every proposition with flags and a brass band. There are a great many people who imagine that all you have to do to secure anything you want at Washington is to parade Pennsylvania avenue with the accompaniments stated. So starting out, we have generally come back minus the brass band and flags. But, to be serious, let me tell you I don't believe that there will be any trouble in securing the legislation in Congress that you require to open the mines; but dont ask too much or think that you can reconcile all interests. That cannot be done. I tell it to you frankly. All this about having a union between the valleys and the hills is rot. I took no stock in that union convention last year. When I learned about the coming together, and, so to speak, marriage of the different conflicting interests, I laughed.

"What you want to do," said Congressman Geary with emphatic earnestness, "is to prepare a naked, simple bill embodying your wants and dissociated from all extraneous interests. Make up such a hill, and I am perfectly satisfied it will become a law this coming session. Remember we cannot pass a great big cumbersome hill. Let your lawyers, you have men of ability and brains in this convention, men like Chief Justice Searles and Judge Walling, and Luttrell of Sonoma—let these men get together and draw up a hill in which is incorporated your wants. Such a hill will pass; but do not embody in it conflicting interests. Don't have anything in it about arid lands. Let what belongs to the River and Harbor hill alone; then there will be no conflict of interests. The way to resume mining is to ask to resume mining and nothing else. This is the only way you can succeed."

Congressman Geary was cheered very heartily when he concluded his remarks.

Judge Searles rose to a question of privilege and denied having made any derogatory remarks concerning Mr. Geary.

Chairman Neff introduced Mrs. Dr. Newlands, who, by the way, is a member of the San Francisco Miners' Association. The lady came to the platform and made a brief speech on mining.

Mr. Myers of Siskiyou moved that the president be authorized to appoint a committee to collect gold specimens, placer and quartz, for exhibition at the World's Fair, and also to consider as to the feasibility of exhibiting a complete set of working plant of hydraulic mining, which was carried.

Niles Searles here read a dispatch he had received from Congressman Caminetti, as follows: "Tell convention that I propose to secure suitable appropriation or not return to California." This announcement was received with cheers.

Mr. Glass moved a special vote of thanks to Major Frank McLaughlin of Oroville, and John Hays Hammond; also to Mr. McMurray, Mr. Luttrell, Mr. Searles and the other members of the delegation to Washington, which was carried.

Then the convention, after electing the officers for the next year (elsewhere reported), adjourned sine die.

The State Mining Convention.

We give herewith the list of delegates from the various counties to the State Mining Convention held here during this week; the committees appointed, memorial and resolutions adopted, financial statement of the State Association, and list of officers elected for the ensuing year:

The Delegates.

ALAMEDA COUNTY.

Blood, W F — Gillett, Chas E — McKusick, H J
Bradley, J T — Hale, W E — Nuesbaumer, Geo L
Casdel, H O — Jackson, D H — Perrine, W D
English, J M — Koser, Newton A — Rutherford, C B
McKilligan, Robt

AMADOR COUNTY.

Barney, E S — Frolech, G — Myers, Jno
Belshaw, M W — Hayes, D E — Parks, J F
Boyson, Dr T — Hale, E P — Reichburgh, F L
Call, A S — Hale, P W — Shaw, S W
Call, Jonas — Judson, E — Tregloan, J R
Christy, S B — Jones, W P — Truscutt, Jno
Caminetti, A — Lepley, J — Taylor, John
Emery, J S — McDonald, M J — Voorhies, E C

BUTTE COUNTY.

Duncan, W E — Hensley, Jno — Price, E B
Halsted, E A — Langdon, H J — Pushbecker, J

CALAVERAS COUNTY.

Cleary, W H — Jeffrey, Wm — Morse, F B
Copeland, Isaac — Lane, C D — Reed, Ira Hill
Davis, Jno F — Lacy, A

EL DORADO COUNTY.

Brown, J M — Hawthorne, J C — Morgan, D W C
Crawford, J J — Jackson, A B — Wickham, D

HUMBOLDT COUNTY.

Bair, T — Cohen, H — Pratt, W H
Brown, T M — Dibbeer, J — Weck, F A
Bull, Jr, J C — Harpst, J — Whipple, S G
Haynes, J P

NAPA COUNTY.

McFarland, A

SISKIYOU COUNTY.

Andrews, M — Daggett, Hon J — Roberts, C
Boyle, J F — Jillson, C B — Spencer, E V
Backus, S W — Myers, A G — Stearns, W H
Deming, T — Parker Jr., A

SONOMA COUNTY.

Allen, S I — Dana, A W — Markley, J
Abbey, R — Frost, C W — McMinn, J Sr
Ames, C G — Luttrell, J K — Ross, H J
Tupper, G A

NEVADA COUNTY.

Andrews, W — Hanley, M — Northway, J A
Bates, M — Hare, O A — Penrose, O
Bigelow, A S — Haskins, J — Preston, E M
Binmeatual A — Helwig, J H — Rauch, A
Bowman, D D — Hogan, M C — Rector, J
Callahan, H C — Hubbard, M T — Riley, P T
Campbell, P — Ismert, A J — Robinson, A S
Carr, J E — Jenson, C — Rolfe, I J
Chadman, O K — Karchickey, O — Ross, A J
Coleman, E — Keeney, O P — Schuesler, C
Crall, S M — Kidder, J F — Searles, Fred
Daniels, T — Kitte, C W — Soarles, Niles
Dibble, A S — Lakeman, J M — Simonds, P F
Dobbie, A E — Lane, H — Saldmore, R
Driesbach, A B — Lutz, F C — Spaulding, H S
Driesbach, N B — Mainhart, G — Thomas, A T
Eastin, C D — Mallon, C — Thomas, R A
Eddy, J — Marsh, M L — Thomas, R J
Elderman, F — Martin, W H — Tilley, E
Engelbright, W F — Marwick, D — Tregidgo, A
English, J — Mason, A D — Turner, O E
Fairweather, T — Mather, J G — Victor, O
Farrel, M J — Miller, A C — Wadsworth, F E
Flood, J — Miller, B H — Waggoner, W W
Foss, W — Mills, H C — Walling, J M
Gaylord, G C — Mitchell, W J — Waters, C L
Glasson, J — Mulvey, J — Watson, S J
Godfrey, F — McBride J S — Welsbein, J
Goldstone, L P — McCall, J F — Wetzel, T
Goodson, G S — McGagan, M — Wohler, O
Gourley, J A — McGlashan, O F — Woodmansee, Dr
Granger, S — McLain, G D — Zaph, O
Grant, O — McMurray, R — Ziedler, F
Griffith, W

PLACER COUNTY.

Abrams, J — Evans, C E — Morgan, Geo
Applegate, Geo W — Filcher, J A — Meredith, J S
Brink, J — Fulweiler, J M — Neff, J H
Booth, W H — Gilbert, E B — Newton, Horace
Burk, Ira — Gleason, M R — Nichols, Jas
Barney, J M — Gould, J L — Nichols, Wm
Breece, A — Greenell, Wm — Perkins, W D
Barnes, R F — Hill, Geo M — Pulfika, Ed
Bubring, H H — Huth, J H — Poppa, J hn
Bell, F H — Hollister, H — Power, H T
Butler, Jno — Hoffman, J O — Redding, Frank
Buell, Frank — Hoffman, Chas F — Remler, L
Clark, Anthony — Hughes, Geo S — Robinson, W J
Colby, G H — Hermann, E J — Rodoni, Antoine
Campbell, A B — Jones, J O — Rosetti, A
Coker, G C — James, Thomas — Smith, A A
Chamberlain, L L — Lardner, W S — Stevens, Amos
Cross, G W — Lawrence, M T — Sullivan, J J
Dolan, E — Longworth, E — Sprague, S M
Dameron, J P — Loyd, R — Simons, Henry
Davis, W — Macy, C T — Thomas, Richard
Durning, J G — McGee hin, David — Tuttle, Fred
Doolittle, J E — Munro, R — Walker, J L
Dunlap, J — Martin, Noble — Wheeler, Judson
Everett, Thos B — McKinley, A — Waugh, R
Walter, Otto

SAN FRANCISCO.

Browne, Ross E — Geary, Hon Thos J — McMurray, R
Burns, D M — Grayson, G W — Pichoir, H
Bowie, A J — Hayes, D E — Ralston, A
Brown, Thos — Hendy, S J — Rix, E A J
Christy, S B — Huntington, F A — Sontag, Julian
Cross, G W — Hammond, Jno Hays — Summerhayes, H J
Church, Thos R — Harvey, J Downey — Scott, Henry
Firth, J K — Irelan Wm Jr., — Thornton, S K
Foote, W W — Janin, Louis — Walrath, A
Glass, Louis — Judson, Egbert — Whitney, J O
Keith, S — Yale, Chas O

SANTA CRUZ COUNTY.

Hoffman, C — Martin, C C

SHASTA COUNTY.

Bell, J — Hart, R G — Scherer, P
Dunbam, W — Hodson, W O — Spence, A O
Hutton, H W — Kleinsmith, H — Waymire, J A
Harlow, W — Paul, A S

SIERRA COUNTY.

Arnold, H B — Denmire, A — Meikle, W
Akers, C D — Deisen, C — Mead, M H
Appel, H — Ellis, O Z — Miller, C H
Arnott J. Jr., — Eschbacher, W F — McGregor, J
Bliss, R H — Ford, T L — McCormick, E
Brown, B H — Forbes, R — Mitchell, D N
Busch, A C — Gorham, J M — Moore, D
Byington, W H — Gassaway, A D — Meyer, H H
Brady, J J — Hughes, W — Newton, L H
Bergan, A — Hayes, P — Nichols, A S
Berry, J E — Hayes, J — Peck, W O
Byington, L F — Heurtzen, C — Sinnott, R J
Costa, J — Judson, R H — Spaulding, H
Cole, D T — Kingdon, H — Vaughn, J A
Carmichael, P — Lebroke, T — Wehe, F R
Dolley, L — McGrath, T J — Wood, O
McNulty, J W — Westall, M

TEHAMA COUNTY.

Matthews, Dr

TRINITY COUNTY

Givens, H R — Martin, H — Maston, J J
Hammer, P P — McMurray, J — Paulson, J S

TUOLUMNE COUNTY.

Maxwell, J J — McCann, T

YUBA COUNTY.

Ayer, C F — Malaly, J — Roberts, A F
Conlin, T — Mayo, O O — Stewart, W J
Chamberlain, W W — Meridan, J — Single, J
Dempsy, J — McQuade, J — Tiffy, R W
Courath, L — Nelson, J — West, J C
Gettins, D — O'Brien, J — White, A S
Jeffrey, G — Peardon, J — Walsh, J

SAN FRANCISCO BOARD OF TRADE.

Hawley, Geo T — Strauss, Levi — Nickelsburg, S

SAN FRANCISCO CHAMBER OF COMMERCE.

Ralston, A J — McNear, Geo W — Watt, Robert

Committees.

Chairman Neff appointed the necessary committees, as follows:

Credentials—J. B. McBride, F. R. Wehe, R. G. Hart, S. J. Allen, W. J. Stewart, W. D. Perkins, A. B. Call, —— Duncan, E. O. Spencer, J. J. Maxwell, H. J. McCusick, M. M. Drew, M. H. Meade, J. M. Brown.

Ways and Means—R McMurray, San Francisco; James O'Brien, Yuba; J. E. Doolittle, Placer; A. Tregidgo, Nevada; H. Pichoir, A. J. Bowie, B. F. Dunnam, San Francisco; John Boggs, Colusa; W. H. Pratt, Humboldt.

Permanent Organization—E. Coleman, Nevada; E. C. Voorhies, Amador; W. B. English, Alameda; C. F. Hoffman, Placer; S. K. Thornton, San Francisco; V. S. McClatchey, Sacramento; Ed. B. Price, Butte; J. F. Davis, Calaveras; C. H. Mitchell, Nevada.

Resolutions—Niles Searles, C. W. Cross, J. M. Walling, J. M. Fulweiler, T. L. Ford, C. G. Yale, Ross E. Browne, J. H. Hammond, J. McMurray, J. J. Crawford, J. K. Luttrell, A. B. Dibble, P. F. Simons.

The Drift Mining Memorial.

To the Honorable, the Senate and the House of Representatives in Congress Assembled—Your memorialists, the Miners' Association of the State of California, in convention assembled in the city of San Francisco for the purpose of considering questions relating to the mining interests, respectfully represent:

That there are in the State of California numerous volcanic-capped mountain ridges, which contain underneath the volcanic-capping, ancient river channels, with a bottom layer of gold-bearing gravel, which is sought by the miner and worked by the so-called drift-mining process, said process involving an expensive system of tunneling or deep-shaft sinking through barren material before the pay lead may be attacked.

The driftminer must locate his claim upon the surface of the barren volcanic-capping, and in order to justify the extraordinary expense of the "dead work" in opening the claim there must be included in one enterprise a considerable length of the pay lead, requiring a number of locations to cover it.

Experience shows that the driftminer finds it practically impossible to secure a title to such a group of claims until the mine is almost worked out, owing to the recent rulings of the Commissioner of the Land Office and the Secretary of the Interior to the effect that "the presumption that the gold-bearing channel extends under said hills, or that it contains gold in appreciable quantities will not answer, and the miner must show the actual existence of the gold."

In other words, the existence of the gold must be shown by actual development in each one of the locations separately before the Land Office will admit its mineral character and proceed to issue patent therefor.

The driftminer is thus debarred from obtaining a patent until his mine is nearly worked out, having no guarantee for title in the meantime.

Congress is hereby respectfully requested to so alter the mining laws, at least in so far as they affect the drift-mining, that the driftminer may be able to obtain title expeditiously.

Let the practice of the Land Office be so altered that patent may issue to a group of consolidated and contiguous claims upon mineral land, provided an actual discovery is made upon any one of them, since the present conditions are such as to deter labor and capital from opening, developing or working this important field of the gold-mining industry.

Naturally, capital requires a showing of title. Under present rulings, title cannot be shown until the mine is practically worked out, and, consequently, enterprise is stopped.

It is respectfully suggested that to meet this difficulty, Congress might take the necessary steps to determine definitely what shall be regarded as mineral and what as nonmineral land.

The Resolutions.

Resolved, That the State Miners' Association of California hereby reaffirms the declarations contained in its memorial, preamble and resolutions adopted at the last Miners' convention of this State.

Resolved, That the State Miners' Association of California approve of the Caminetti bill, with the amendments proposed by Senator Felton, and recommend in the interest of the mining industry of California the passage of that bill, with the amendments; but we further recommend that all reasonable efforts be made to secure an appropriation of $450,000 for the purpose of the construction of the dams provided for in said act; and we recommend that the word "must" contained in section 9, as proposed by the amendment of Senator Felton, be rejected, and the word "may," as contained in the original bill be restored, or that there be added to the bill the following proviso: Provided, that this act shall not be so construed as to prohibit the carrying on of any mining operations, prior to the construction of said dams, which can be conducted without material injury to the navigable streams of the State or lands adjacent to said streams.

Resolved, That this convention recommends that the legislature of California make an appropriation to assist in the construction of such impounding works as shall be recommended by any committee of engineers duly appointed for the purpose under any act of Congress which may be hereafter enacted.

Resolved, That the interest of the gold-mining industry of California requires that Congress should pass an act the force and effect of which shall be that all lands which have ever been returned by the United States Surveyor-General as mineral in character, or lands within the well-recognized mineral belt, shall be presumed so to be before the Land Department until the contrary is clearly shown, and that the chairman of this convention be requested to appoint a committee of five to draft such legislation as will reach the wishes of the miners of California upon this subject, report the same to the executive committee of this association for their adoption, and that the same be transmitted to our Senators and Representatives in Congress.

Resolved, That this convention is in favor of and recommends the passage of a law providing for the free coinage of silver.

WHEREAS, The geological map of the State mineralogist in the State mineralogist's report, and issued by the State Mining Bureau, has been of great benefit to the mining community;

Resolved, That we recommend that a new edition with progressive work thereon be brought out, that shall contain more detailed description of the mining regions of California.

Resolved, That the work and purposes of the State Mining Bureau are hereby cordially indorsed by this convention.

WHEREAS, The committee sent to Washington by this convention telegraphed for 1000 copies of the State report on auriferous gravels, and there being only a few copies issued;

Resolved, That the trustees of the State Mining Bureau be respectfully requested to issue 2000 copies of said report.

The Officers.

President.....J. H. NEFF of Placer
Secretary.....W. C. RALSTON of San Francisco
Ass't Secretary.....THOS. B. EVERETT of Placer
Treasurer.....HENRY PICHOIR of San Francisco

VICE PRESIDENTS.

Alameda.....F. Chappellet
Amador.....John Myers
Butte.....W. E. Duncan
El Dorado.....J. M. Brown
Nevada.....A. Tregidgo
Placer.....C. F. Hoffman
Plumas.....W. N. Goodwin
Santa Cruz.....C. C. Martin
Shasta.....R. G. Hart
Sierra.....F. R. Webe
Siskiyou.....A. G. Myers
Sonoma.....S. I. Allen
Trinity.....H. P. Givens
Yuba.....W. W. Chamberlain

EXECUTIVE COMMITTEE.

Alameda.....H. G. Blasdel
Amador.....A. B. Call
Butte.....E. B. Price
Colusa.....John Boggs
El Dorado.....J. J. Crawford
Nevada.....J. S. McBride
Placer.....J. L. Gould
Plumas.....W. W. Kelloggs
San Francisco.....R. McMurray
Santa Cruz.....—— Hoffmann
Sbasta.....W. G. Hodson
Sierra.....D. T. Cole
Siskiyou.....R. H. Campbell
Sonoma.....A. W. Dana
Tehama.....Dr. Matthews
Trinity.....Henry Martin
Yuba.....Jas. O'Brien

AT LARGE.

John Hayes Hammond, — Julian Sontag,
Louis Glass, — D. E. Hayes,
S. K. Thornton, — A. J. Ralston,
Thos. R. Church, — Wm. Irelan, Jr.,
B. F. Dunham, — C. W. Cross,
Chas. G. Yale.

The Cyanide Process in South Africa.

SAN FRANCISCO, Nov. 15, 1892.

TO THE EDITOR:—The New York *Engineering and Mining Journal* of October 8th and 15th publishes two articles on this snbject by Chas. Butters, Ph. B., and John Edward Clennell, B. Sc. It appears that, except in the magnitude of operations, the Africans are not a whit in advance of our friend Almarin B. Paul, of Shasta county, Cal., or rather I should say that they are distinctly in the rear as to practical work, as may be seen by comparing the articles in question with some that have appeared in the MINING AND SCIENTIFIC PRESS. The process in Africa has been successful only when applied to tailings of free-milling ore, having failed on ore containing pyrites, and on concentrates. They have been using square, wooden vats of 35 to 50 tons capacity, only lately having hegun to use round vats (tubs?) which, however, are of enormous capacity. At the Langlaarte estate, the new vats hold 400 tons of tailings each, and are discharged by means of a dredger, which is a recent improvement, as previously the exhausted material was shoveled into tram cars and so removed. Still larger vats were under construction for the New Primrose mine.

The method of working is thus; the vat is nearly filled with the moist tailings, and a cyanide solution of 0.6 to 0.8 per cent strength is added till the ore is covered. The ore remaios io contact with this liquid for 12 hours, and then the solution is drawn off and passed at once through the zinc boxes. Weak solution of 0.2 to 0.4 per cent is then allowed to filter through the ore for about 8 to 10 hours and is passed to a special zinc box, finally a sufficient quantity of water is applied to displace the solution from the ore. The "weak solution" is that which has already been used and has passed through the zinc boxes. At the Robinson Works the experiment nf "circulating" the solution (as Paul has been doing) was tried with great economy of cyanide, but the anthor states that there is danger of a reprecipitation of gold in this way. (Paul strengtheos his solution a little before returnlng it to the vat) Another suggestion is, to pass the solution through a series of charged vats, so as to get a strong solution of gold for the precipitation.

A new method of precipitating the gold, known as the *Mulloy process*, is under trial and is described as follows: "The solution (of gold) passes through a shallow trough containing mercury, in which is an ioner cylindrical vessel filled with solution of carbonate of soda; the edges of the cylinder just dip beneath the mercury so that its cootents are entirely cut off from the outer portion of the vessel. A rod of lead dips into the soda solution; the lead and mercury are connected with opposite poles of the battery, and the solution is electrolyzed by the passage of a current. The sodium combines with the mercury to form sodium amalgam, which at once decomposes the gold cyanide solution with formation of ordinary gold amalgam, sodium cyanide beiog simultaneously produced." If I understand this not very luminous description, the process seems very promising, though I think a much simpler method would answer quite as well. I propose to see about this. The melting, according to this article, is barbarous. Though not distinctly so stated, it is clear that hlack-lead pots are used, whlch is all wrong, unless the precipitated gold should be freed from zinc, etc., before melting, and this is not done. It is not surprising, therefore, that, although they add sodium bicarbonate to oxidize the zinc, which is good practice, the bullion comes out only .650 fine, hard, brittle and homogeneous, the pot is rapidly destroyed, and a considerable quantity of gold is lost by the volatilization of zioc. Paul loses little or no gold, and gets his bullion .950 fine.

The loss of potassium cyanide is stated to be 3 pounds per ounce of gold recovered when treating free-milling stuff containing about 10 dwts. of gold in the ton, the loss in the vats alone being 1 pound per ton of ore. The extraction is from 70 to 80 per cent, but it is admitted that a much higher yield is obtained io smaller operations when a relatively larger quantity of solution is used. Probably the results would be better if the first or strong solution should be allowed to percolate iostead of standing, and should be circulated more or less, even though no larger quantity should be used. It is well known to silver lixiviators that merely soaking the ore in the liquid, without movement, effects very little. We always stir the sugar in our coffee in this country; do they let it "stand" in Africa?

THE CHEMISTRY OF THE CYANIDE PROCESS.

The two following numbers of the *Journal* contain artlcles, by the same authors, on this subject. These articles are confessedly compilations, but are instructive and interesting. They confirm most of my statements on the subject, not contradicting any, but not touching on all, while giving other facts or opinions of which I was not aware; for example, they make no comment on the unquestionable fact that caustic alkali protects the cyanide from the decomposing effect of atmospheric carbon dioxide, but they claim that the presence of alkali "tends to produce that peculiar and little understood decomposition termed 'hydrolysis.' In this reaction the alkali appears to determine a chemical change in which water plays a part, while the alkali itself is not in the least affected. * * * The hydrolysis of potassium cyanide, which undoubtedly occurs to a considerable extent when excess of alkali is present in the solution or has been added to the tailings hefore treatment with cyanide, gives rise to ammonia and potassium formate

$$KCN+2H_2O=NH_3+HCO_2K.$$"

It is stated, in a foot-note, that "hydrolysis occurs mainly in the zinc boxes and seems to be induced by the presence of the metal." This is another reason for getting rid of the zinc box as soon as possible. We shall then be able to avail ourselves of the advantages of caustic in the solution which, at present, has the disadvantage of greatly increasing the quantity of zinc dissolved, whether there is anything in hydrolysis or not. By the way, Paul found a reduced consumption of cyanide while using caustic lime in excess with an ore which certainly did not cootain much sulphuric acid.

Another interesting statement is that "there are grounds for supposing that in dilute solutions a dissociation of the cyanide takes place, so that what we term a weak solution of potassium cyanide is in reality a mixed solution of potassium hydrate and hydrocyanic acid

$$H_2O+KCY=HCy+KHO.$$

The truth of this theory is supported by the extraordinary fact that a distillation of hydrocyanic acid takes place when a current of a neutral gas (*e. g.*, nitrogen) is passed through a cold dilute solution of cyanide." The acid may or may not answer the purpose of dissolving gold, under the conditions, but, as it is very volatile, much of it must escape from the solutions, as is very properly remarked by the authors. I think, however, that the experiment with nitrogen should not be conclusive; yet, if there is truth in the general proposition, it forms another argument in favor of aholishing the zinc box and uslng stronger solutions.

The writers next review the effect of oxydized sulphurets, showing the destruction of the cyanide by the formation of various compounds of cyanogen and iron, and then discuss the rationale of the application of lime water or caustic soda to prevent such destruction. All this is the more interesting from the fact that the authors, having written without the fear of a James Smith in their minds, have given the formula of each reaction alleged or suggested.

The action of the zinc shavings is considered with regard to the precipitation of the metals and the formation of zinc cyanide, both by replacement and by the electro-chemical effect of the zinc-gold couple, the latter also producing caustic alkali; all as I have stated before in this paper, except that I did not give the formulas. They suggest that the black deposit on the zinc is a "chemical compound of gold and zinc." I have suspected it of being a compound, but thought it might be analogous to the copper compound which I discovered at Calumet, which acted remarkably like *cuprous hydride*. The authors mention copper among the metals recovered, but make no comment on its condition. The different methods of precipitation, and of cleaniog the gold, as tried or suggested, are noticed briefly, and then the methods of assaying the solutions come in for discussion.

It is claimed that the ordioary assay of the solution for available cyanide, as practiced here, fails in accuracy when zioc cyanide is present (always that detestable zinc!) "A white flocculent precipitate occurs at a certaio stage, probably consisting of simple (insoluble) zinc cyanide formed by decomposition of the double cyanide

$$K2ZnCy4+AgNO3=KAgCy2+ZoCy2+KNO3.$$

This precipitation occurs long before the whole amount of potassium cyanide has been converted into the soluble double salt of silver ($KAgCy_2$), for the solution, after the appearance of the flocculent precipitate, still gives the Prussian blue reaction with acidulated ferrous sulphate." Mr. Bettel, at the Robinson General Mining Company's works, has introduced a modified assay process, as follows: "Two perfectly clean flasks of equal size are taken. To each of these is added a considerable bulk, say 50 c. c. of the solution to be tested, and 50 c. c. of water. The liquid in both flasks will probahly appear slightly turbid, but the degree of turbidity will be the same in each. Standard silver nitrate solution is run ioto one flask until the slightest possible increase in turbidity is observed in comparison with the liquid in the other flask. This point is taken as indicating the conversion of the whole of the free potassium cyanide into the soluble silver salt, and, therefore, as determining the amount of available cyanide present in the solution."

From the foregoing, it seems probable that some of our operators may have been led into underestimating the strength of their solutions. The chemist at the Calumet works, however, was aware of this flocculent precipitate, and he used to continue adding the silver nitrate until he was satisfied that the proper precipitate was formed. Some add a very small quantity of salt to the liquid to be tested; the formation of silver chloride then shows the ending.

Mention is made of a white powder which is produced in the zinc box, and consists of a compound of zinc and cyanogen; it forms in preseoce of alkali in the solution. Whether or not this is the white powder which I observed I do not know, but certainly it is different from a bluish-white sample, sent to me by Mr. Paul, which yielded no zinc, as tested hy the blowpipe, and consisted mainly of iron in combination with cyanogen. C. H. AARON.

The Discovery of Iowa Hill Diggings.

Reminiscenses of Persons and Events.

SHADY RUN, Nov. 7, 1892.

TO THE EDITOR:—Forty years ago, on the ridge hetween Indian and Shirt-tail canyons, was a small mining camp of large business proportions. It was the great center of trade for all the mines of the upper gold belt. More $50-slugs, nuggets and gold-dust changed owners here on the holy Sabbath for meals, grub and over the gray blanket (the green cloth had not got this high in the monntains at this time) than any camp of its size in the country. The houses were more useful than ornameotal, all built in the primitive style, of poles and shakes. There was one hotel here; the eater could get a meal for $1 got up in the best shape known to the chief cook—a "Portugee," who had seen much service in that capacity on board of whalers. He was a great success on duff, but it would take too much space to detail what he could and did do.

There were two stores where a miner could get everything he needed, and more too. There was one spacious saloon where the gray blanket was spread on tables loaded with nuggets, slugs and gold-dust. Bill Roland and Andy Vaughn had charge of the menagerie.

The only white woman in the mountains here was Elizabeth Brown, after whom the camp was named. Such was Elizabethtown at the time of whlch I write.

Two of the common miners of this little camp have been carried by the tide of affairs high into public prominence and affairs. They are Jake Neff and Alhert Hart.

There was a colony of lead miners, some of whom had struck the diggings at Wisconsin Hill. There were two brothers and their uncle of this colony—Thom and McKenedy and the uncle, Mr. Sitton. McKenedy was a worker and a good prospector. Thom and his uncle inclioed more to spades and diamonds than pick and shovel. I, in company with Jake and Burr Glasscock and others, were working in Refuge canyon, just south of Elizabethtown. In favorable weather I prospected for hill diggings. On one occasion, while out looking for a place to prospect, I discovered several holes a few feet in depth sunk at short intervals along on the rimrock, on the north side of the gravel range. I thought the gravel looked fine for pay, hut had no pan to test it. A few days after this, I met McKenedy. We always talked mining and prospecting when we met. I told him of what I had discovered; thought I would go over soon and test the gravel. A few nights after this meeting with McKenedy, it was confidentially whispered about Elizabethtown that very rich diggings had oeen struck, but no one but the discoverers knew where they were. The next morning about daylight I stopped on the ridge to rest a bit, after climbing the hill from Indian canyon. A clap of thunder would not have surprised me more than the sound I heard coming from the point of my destination. It was the sound of the ax on the stakes that were being driven around the holes that were sunk. The discovery of Iowa Hill was out, and all the ground that was then considered rich was staked off, and I was left. It came out that McKenedy had the ground well prospected and located several claims for friends at $100 a claim, the money to be refunded if the prospect and location was not satisfactory to the purchaser. Those claims proved to be very rich, and were known as the Jamison claims of Iowa Hill. J. F. TALBOTT.

Mining in Southern California.

Searching for "Lost Mines."

SAN FRANCISCO, CAL., Nov. 11, 1892.

TO THE EDITOR:—I am in receipt of news from the southero part of the State which may interest many of your readers. Mining is beiog pushed quite vigorously in Sao Bernardino county and the winter months promise some new developments in the desert country.

A new silver property is being opened in the Cajon pass, about 30 miles from the town of San Bernardino and not a great distance from Cajon siding. Report says the lead is 50 or more feet in width, consisting of alternate hands of hard and soft material, which returns by assay from $12 to upwards of $30 per ton, mostly silver. At least this is the claim made hy the owners. The mine is opened by a tunnel running in on the strike of the lead about 60 feet, where a crosscut extends "from wall to wall" as represeoted. At the face of the west crosscut a drift extends along the haoging wall a distance of 35 feet; at the face of this drift a vertical shaft is sunk 26 feet and a crosscut run again to the hanging wall 12 feet distant. The total cutting is about 200 feet.

Work is being done on each extension of this property, both north and south. If the reports reaching me concerning this group are reliable, the work now being done may result in the opening up of a mine of great value.

In Lone valley the Rose mine is producing bullion steadily and is also shipplng some high grade ore and building large low-grade dumps for future treatment.

At Silver Reef, 40 miles east of Victor, considerable ore has been mined and piled on the dumps during the past summer and fall months. The value of the ore is extremely variahle, running from 15 or 20 ounces to several hundred. It is mostly chloride and embolite; very little sulphide has ever been found. Iron oxides and copper carbonates, and particularly the latter, characterize the better grade of ore. Some of it also contains high value io gold. Most of the ore bodies thus far developed are small, but the claim owners all hope to open larger masses.

On the desert not far from the Colorado river and below the Needles some prospectors have discovered a copper prospect which will probably be opened the coming winter. As usual, the claims made for the new find are extravagaot, such as, for instance, "a lead 200 feet wide averaging 20 per cent copper, and growiog richer as depth is attained." Prospectors should refrain from making such statemeots as no one believes them and their chances for interesting capital are not enhanced but are actually decreased.

The Tiptop mine in the lava beds, not long since shipped up to San Francisco 85 tons of copper ore averaging 33 per cent copper and 15 ounces silver per ton. The ore was shipped to Swansea, Wales, for treatment.

The owners of claims in the newly discovered districts of Eagle mountain in San Diego county, and the Monte Negras in San Bernardino will put in the winter developing their numerous properties.

In the New York and Vanderbilt districts in San Bernardino county, north of the line of the Atlantic and Pacific railroad, mineowners are working, and these new camps are attracting considerable attention.

The craze to find the lost "Pegleg Smith" mine seems to have died out. Last winter and spring and up to the summer mooths, scores of men were out scouring the desert for this lost mine. Each and every one of them had "straight pointers," and felt confident of finding the long-lost bonanza, but it still remains unfound. I have been told by men whom I consider reliable, that this Pegleg story is a fabrication, pure and simple, and was first told to make a newspaper yarn. Being repeated over and over again for a period of several years, it became a "settled fact," and hundreds of men believed in its existence.

The amouot of hardship and expense, to say nothing of the loss of life which has resulted from the endeavors to find this Pegleg mine, it would seem, would deter men from making further search for it, but I expect the terrific

heat of summer bas nnly held tbem nff, and this winter will doubtless see a repetiton of the same scenes that might be witnessed last season nn the Colorado desert.

The search for the "Lost Lee mine" has also died nut. Lee was a poor, ignnrant prospector who had the most peculiar ideas about minerals. He at one time nwned what is nnw known as the Waterman mine, located not far frnm Barstow. Lee, in speaking nf the prnperty, used tn call it a quicksilver mine. He never suspected the existence of silver in the rock it seems, thnugh I am tnld in his discovery shaft chlnride cnuld be seen nn almnst every piece of nre. There was not a trace of cinnabar in the nre, though it was stained a deep red from iron nxides.

The "Lost Lee" mine is suppnsed tn be located east of Old Woman's Springs somewhere, and is sometimes spoken of as "Lee's white-metal mine." Lee called it a white-metal mine himself. One day in speaking to a friend of mine of his white-metal mine, my friend asked if white-metal was silver. "Oh nn," replied Lee. "It isn't silver, its this white-metal they make these fine stoves of, and is worth a heap more than silver."

The Good Hope mine near Perris in San Diego county is one of the most promising mines in the State. It has been opened by the present owners during the past two years from an abandoned mine with little value to a valuable property. There are three shafts on the vein, two of which are over 400 feet in depth; the center one reaches a lower level, but starts at a lower point on the surface. An ore shoot 800 feet long has been opened, and the workings as they are extended make the mine larger every day.

The mines of the North Fork district situated at the very head of the San Joaquin on the line between Mono and Fresno counties are attracting some attention. The claims are not very extensively developed but give considerable promise. They lie between the Mammoth on the south and tbe Tioga on the north. It is probably only owing to the inaccessibility of this district that it has not heretofore been extensively developed, but this trouble seems about to be overcome.

The coming winter promises considerable interesting development all over the State, particularly in the soutbern section. The northern portion does not suffer on account of scarcity of water and from the intense heat that make life a burden in the southern part during tbe summer months. W. H. STORMS.

Iron vs. Wooden Ships.

A Criticism of the Construction of Modern Iron Vessels.

SAN FRANCISCO, Nov. 12, 1892.

TO THE EDITOR:—Iron ships 20 years ago and iron sbips to-day are two different things. Are iron and steel going to lead in shipbuilding? How handsomely they float on the water and alongside of our docks; every new invention and method is introduced to make the working of them neat and complete. Engineers are fast taking the lead in the construction of iron ships in place of the sailor.

There is no question but that the Iron ships now entering our ports, as far as appearance goes, are perfection itself, and yet they are continually reducing the metal in construction and cost of building. How long are underwriters going to pay for these floating coffins in disguise, before they awaken to the fact that shipbuilders and owners are building these ships for them to pay for?

Books of any business will show profit and loss. With the enormous tonnage of England the insurance companies should get rich and pay large dividends, and they would if they had a fleet of wooden ships instead of iron, or iron ships built as staunch and substantial as they were 20 years ago. Twenty years ago the average size ship was about 1200 tons register; her hull constructed every way proportionately as in regard to depth of hold and so forth.

As shipbuilders in those days allowed so much depth of bold in proportion to lengtb and breadth of beam, the wall sides given the ship of those days gave sufficient longitudinal support, and in all cases larger and heavier material was used in their construction.

Since then, year after year, shipbuilders have increased length and breadth and reduced depth of hold in a great many instances, and in no case increased the depth. The longitudinal support of the long ships they are building today is not sufficient to bold them in a heavy sea. When tbey sit on tbe water and get the support equally distributed under them, anything will hold. But in a heavy sea when a ship sits down on a sea under her middle which has to bear the weight of her both ends as well as her cargo, it takes more to hold than the engineers figures can find a base for.

An iron ship steaming in a seaway is subject to the same laws that any iron is under a heavy strain, and it becomes crystallized through twisting and straining.

Let any insurance company in England overhaul its losses and see how many ships are lost annually that no one knows what becomes of them, or wbat was the deficiency in tbeir construction, or what the cause of their loss. All tbey know is, that tbey must have gone to the bottom and they have to pay for them. The engineer has the means of ascertaining the strength necessary for a piece of machinery or a boiler, but what means has he to determine the strengtb necessary for one of those long ships loaded, when laboring in a heavy seaway. A wooden ship, when sbe is straining, shows her weakness and commences to leak, and thereby gives warning; but an iron ship gives no sucb warning. She strains until the weak part goes; sbe opens out and goes to the bottom, and no one knows where the defect was, in her construction or material. She must have gone to the bottom and they have got them to pay for. How often do we see a piece of iron or a boiler come out of the ship, supposed to stand a certain strain; when but half of this strain has been applied, it gives way and breaks, caused by crystallization or some other defect in the iron.

A cable chain, when it cnmes from the factory, is put to a certain test before it is put on bnard nf a ship, and very seldom one single cable is put on the stretch and the strain put on that it is suppnsed tn stand, without one or mnre defective links being fnund, caused by a flaw in the iron nr crystallization taking place, which so nften has surprised engineers. One day a piece of machinery has been run tn its utmost capacity and stond the test, and the next day broken dnwn just by a wnrking strain. Take a cannnn, for instance; it is put tn the severest test before considered ready for service, and how many there are come from the factory that have prnved failures, although they all pass through the same prncess nf manufacture.

The breaking strain nf a wnoden ship tn-day is twice as great as an iron ship; the only difference is that a wooden ship commences to leak before she breaks entirely, but when an iron ship commences to leak it is usually fatal, and she goes to the bottom, while the wooden ship finds a port for repairs, as a rule, and is seldom a total loss to underwriters. Though they may be at times under expense for repairs, often weathering a heavy storm, they live to pay back; while an iron ship, if she comes into port at all, generally comes in a good condition, looking well, with no sign of weakness perceptible. Wooden ships can be built to last 20 years, and since galvanized iron for fastening has been introduced, can be made to carry any cargo as dry and safe as any iron ship that was ever built. But builders must change their mode of construction and pay more attention to strength in putting their material together. What means has the sailor, or the owner, or underwriter to know what strain an iron ship will stand when she is completed at the shipyard. The only time it is tested is in a heavy gale at sea, and that has proved fatal only too often, as records will show. If there was any method for finding the strength necessary in an iron ship, and any method known for testing them before they left their yards, I venture to say that many ships built in the last five years would have not been allowed to go to sea. Who can tell whether there is one, a thousand, or more rivets crystallized? Those long steel ships are known to spring so as to open several butts in their decks when pitching in a sea. Some of the iron and steel used nowadays in ship-building is much nf a cast-iron nature. The masts and yards are subject to the same laws as the hull. Wooden ships have been dismasted at sea, and rigged up again with what few spars and other material is usually carried aboard of any ship. In such case an iron ship is helpless and has to make port. A carpenter's broadax can do more at sea under difficulties than a cold chisel and hammer. Now, since the old way of building ships as to the dimensions has changed, the material used in construction must also be changed, in order to get the necessary strength for those long ships. A large ship should be timbered as customary, and before the keelson goes in, a diagonal ceiling of any width and thickness in proportion to the size of the ship should be put in. Then put in keelson and longitudinal ceiling as usual; outside diagonal planking to lay opposite to diagonal ceiling inside. Then put on the longitudinal planking and and proceed to knee and fasten the ship as usual. A ship built in this way, of first-class material, fastened with galvanized iron will certainly last 20 years and class A 1. There are on this coast of California vessels built of Oregon pine that have been in service for 20 years, and are still good seaworthy vessels, which goes to show tbe superior qualities of this class of wood for shipbuilding. The large lumber schooners built on this coast at a cost of $50,000 and over, are too shallow for their length, and need diagonal bracing for at least one-half their length amidships in order to make them strong enough to carry any kind of cargo. Even should the material intended, in the first place, be reduced sufficiently to give the diagonal bracing, the vessel would then be much stronger than she would be without. C. F. SWAN.

Gravel Mining in Placer County.

From Our Traveling Correspondent.

The Paragon or Breece & Wheeler.

TO THE EDITOR:—The B. and W., situated at Bath, a mile above Forest Hill, was the first to develop the Blue lead, and at its upper known extremity here it has been cut away by the Middle Fork. Two years and a half ago, however, the company had worked 8000 feet to the limits of their property. Since then they have been busied developing the cross-channel, or Orono, of the Mayflower. The extent of this latter channel is as yet quite undetermined, as it has only been developed at these two points. The supposition is that it is a continuation of the Hazard or Weske channel exposed a few milles farther up the divide.

The Orono does not seem to have cut entirely through the Blue lead, as in places the cement gravel of the latter is the bed of the former. The same tunnel that served to work the original channel is used in the present developments to a point 5000 feet in, and from which it is necessary to work by upraises of about 40 feet. This upper channel has been opened about 800 feet, and in places bas shown a width of 450 feet.

During the past three montbs $5000 have been spent in repairing and rebuilding the mill, putting in new batteries, self-feeders, etc. Ten stamps of 850 pounds, with 97 drops a minute, crush an average of 34 loads per day of 12 hours. A three-eightbs wire screen is used. The gravel averages $6 a ton, while the cost of mining and milling is put at $2 75, leaving thus a very fair margin of profit. Thirty men are employed. Mr. W. H. Grinnell, the general superintendent, stated that an electric-power plant would in all likehood shortly supersede the steam of the present.

THE HIDDEN TREASURE.—Mr. H. T. Power, late of the Mayflower, has been superintendent since the 1st of July and is the largest owner. About this famous mine has grown up the thriving little mining camp of Sunny South, five miles above Michigan Bluff. The channel is entirely distinct from those mentioned of the lower divide, not being generally traceable southward except on the extreme eastern points, the remainder of it having been entirely effaced by the erosion of present watercourses. The Hidden Treasure ran north 9000 feet to their bounds. Here a lava flow caused a break in the channel and its upper continuation of the old Mountain Gate, the channel being generally known as the Mountain Gate nr "White" channel from the quartz character of its gravel. For a great distance this old river-bed is divided by a high ridge of rock, razor-back and islaud-like, which turned the ancient waters into an east and west channel. It was in this western one that the old workings were, and when the end of that had been reached it was supposed that the mine was worked out. The discovery of the east channel two years ago revealed a second Hidden Treasure. At 5000 feet in an east drift disclosed this. Since then work has gone on here toward the face of the mine, a distance of 500 feet and an average 160-foot breast, the gravel being removed through the old tunnel. At the same time a tunnel is running from the front and is in 2300 feet. By the 1st of January it is expected to connect with the back workings, and the mine will then be fully and finely opened. One hundred aod fifteen men, for the most part Chinese, are employed.

THE EUREKA, eight miles above Sunny South, is a property regarding which I was unable to learn much. but for which much in the future is anticipated. Mr. Felix Chappellet is forming a company for its development.

THE RED POINT, situated five miles beyond Sunny South, is operated by a French company, and is under the superintendence of Mr. Chas. F. Hoffman of Oakland. The mine is in the channel known as the Golden River, and is distinct as far as known from those previously mentioned. At this point its course is east and west.

Gravel was struck here in 1888 and work has since progressed continually. The channel was reached by a south tunnel 2200 feet in length and a 20-foot upraise. It was worked west to the limits where it was very rich. East, it has been followed a mile, varying in width from 75 to 700 feet, but always paying best from 200 to 300 feet width. The average pay chute of gravel is about 8 feet in depth. Few pillars are left, all the gravel between the lava-capping and the bedrock being taken out, and timbering is consequently without its usual difficulties.

The gravel is blue and free-washing, and the gold is generally fine and scale-form. Since the mine was opened, Mr. Hoffman states that the average per car has been $2.50. That the gravel runs much higher than this in places may be judged from the fact that the day I visited the mine, I saw an ounce of this fine gold washed from a single pan of dirt from a portion of the mine just then being opened. At present about 100 carloads a day are taken from the mine by a force of 70 men. In the mine there is an unusual and continuous flow of water, amounting to 40 inches, which is carried off in pipes and furnishes the water for washing.

Adjoining the Red Point on the west, and where it proved richest, is the Bob Lewis claim of Mr. Robert Lewis, who seeks purchasers at a good, plump sum.

This completes the list of prominent gravel mines on the divide proper. The Iowa Hill section is distinct and has as its most important properties the Waterhouse & Dorn and the Morning Star.

THE WATERHOUSE & DORN, formerly known as the Harman, is operating two large Bryan mills, though owing to slackness of water, only one is running at present. A modern ten-stamp mill is to be built in the spring, for whicb much of the machinery is now ready. For the past six months the mine has been doing well, and the anxiety of the proprietors to sell has given place to a feeling of satisfaction and faith in the property. In early days the mine was worked a distance of about 2000 feet and 70 feet in deptb by hydraulicking, and could now be similarly worked even to the bedrock. With the present milling mode, it is developed by a 1200-foot tunnel nortbward, with the course of the channel on slight pitch. The present work is that of development. The pay streak runs from six to seven feet in length and 90 in width. Mr. Ellint West assumed charge as superintendent in April of this year.

THE MORNING STAR.—This is rapidly coming to assume among gravel mines a position similar to that held by the Idaho, in quartz, as a dividend-payer. Like the latter, it has a small number of shares—2400—whicb in a degree account for the four and five dollar monthly dividends. As shown by the last annual report of the superintendent and president, Mr. J. H. Neff, the mine has produced the past year $150,000, and the average of the gravel milled has been $7 a car.

The ten-stamp mill has run for the past 30 years, and is one of the oldest on the divide. It is intended to add shortly ten more stamps, put in self-feeders, etc., and remodel the works on a modern basis. Lately, the company has purchased the Iowa Hill canal of the Coleman Bros. of Grass Valley, and are now preparing to introduce water-power. In time the canal will likely be extended to some permanent water supply high in the mountains, as was contemplated by the original projectors. At present the mines of this whole section and of the divide are dependent upon the limited rainy season, and for three months at least water is unavailable for mining purposes and steam becomes necessary in consequence. Witb this intended introduction of water-power, the company has lately laid 2400 feet of lapwelded pipe, securing 460 feet of pressure.

The working tunnel of the mine is in bedrock and run in a southeasterly direction 3200 feet, and up the channel, which is reached by upraises. It is believed that the channel in which Waterhouse and Dorn are operating merges eventually into the Morning Star, while there is still another branch channel lying to the east of the former and toward which present developments in the Morning Star seem trending. The cbannel at present is 170 feet wide and 18 feet deep. Owing to the consequent higb breast, timbering is unusually difficult.

This about concludes the gravel interests of the county. In annther letter I shall give an account of Placer county in quartz. CHAS. E. TOWNSEND.

Mechanical Progress.

Cement Walks.

A correspondent writes and asks the *Operative Builder* to publish some rules or methods for making a cement walk for lawn or garden. As he lives in one of the central States, where the frost is not very severe, perhaps the following method may not only answer his purpose, but may also be of service to others of our readers:

This has been furnished the *Builder* by a practical worker in this department: First, remove all loose earth, and with a heavy earth rammer get the bottom well beaten, having a slight fall to the lowest general point. Then provide the best filling the locality can supply, such as brick rubbish, broken stones, or coarse gravel solidly packed to a sufficient depth from the finished surface required. Coat over this rough ground with a mixture of sharp coarse sand or gravel, six measures of same to one Portland cement. This I get a laboring man to lay on with his shovel, and roughly level I use a garden syringe to spray over the ground before I lay on. This helps to make it go together compact. I also give to the earth a good ramming. Having my rough prepared thus, I find the level for my finished surface and set two wooden rules about five feet apart. Their upper edge must be straight, and set level to height of floor required. I then fill in a mixture of four parts sharp clean gravel to one Portland cement between the rules, and with a straight edge I get a good level surface by rubbing same to and fro, taking down all mixture that stands over rules. This course I also beat gently to a solid body. If a medium finish is required, I merely hand-float, having a mixture of a finer kind to lay on for leveling up any hollows. I also at this point remove my inside or first rule and fill in its space. If a fine finish is required, I then coat over with neat cement, and trowel to a smooth surface. I always finish complete in one body any portion commenced on rough ground. If I cannot complete floor or path, I continue shifting wooden rules, as described, till I get to the finish. Be very careful at each joining to blend with old and new together by roughing up, then sprinkle with water, drudge in cement, and give a rub of stock brush. The strength or thickness of a floor is to be calculated by the traffic or weight it has to undergo. A great deal depends on the solidity of the bottom earth and packing. I have made very good paths and floors, as described, at four inches deep, including the coating of filling materials, the cost to be calculated by the locality where the work has to be done. I have often tested the weight of a cubic foot of cement as emptied out of the bags. On the average, I find it equal to 90 pounds; likewise coarse washed gravel at 99 pounds, four cubic feet of gravel and one cubic foot of cement, when mixed and packed in floors, will reduce to three and a half cubic feet. Knowing the price of these on sight, the quantity required will give the cost plus the labor. I make an allowance of five per cent for waste. The essential point is to have the gravel, sand, or any other mixture clean and free from dust. I generally wash all the sand I use with cement; bring it to a shallow running stream, throw it in, and turn till the water runs clear. In mixing, I lay down rough boards and form a floor. I then get any suitable old box, knock the bottom out and nail two pieces on each side as handles, have my washed sand close by, place the box on floor, and fill water measure, lift box with ease, the sand remains on floor. If a mixture of broken stones is to be added, I level the sand, place box on same, and measure as I did the sand. I then level over the stones and have the proportion of cement spread over evenly—a very handy tool for doing this is a coarse broom, by drawing it toward the workman. I then turn and mix till the cement is evenly distributed. I then wet with a large watering can having a good large rose. I do not mean this as instruction for professional men in towns, but as a hint to poor fellows like myself isolated in a country village.

LOCOMOTIVE FIRE-BOXES.—Some time since, at a meeting of the Master Mechanics' Association, the question of the material for locomotive fire-boxes came up. One of the leading western roads had locomotives whose steel fire-boxes had shown exceptionally good service, and since they were very old, the conclusion was jumped at that the steel must be crucible steel. One of the leading makers of both crucible and open-hearth steel urged the use of the former on the ground of this splendid record, and the opinion was widely accepted that after all, for real hard service, the good old crucible steel fire-box plates were undoubtedly the best. Unfortunately, an engineer of an inquiring turn of mind had an analysis made of the alleged crucible steel. A glance at the results showed the characteristics of open-hearth steel, and none of the distinguishing elements of crucible steel. It is probable that the plates were among the first turned out at the old Norway works.

A Big Sound Boat.

Last month, at the shipyard of the Delaware River Iron Ship-Building and Engine Works, Chester, Pa., the first section of keel was laid for a new steamer for the Old Colony Steamboat Company of New York, which is designed to beat the record for size, speed and carrying powers of any vessel of her size at present afloat. The new vessel is to supplement the company's Sound fleet, which includes the fine well-known boats "Puritan," "Pilgrim" and "Plymouth," all of which were built at the Delaware River Shipyard, and are splendid specimens of maritime architecture.

The following are the principal dimensions of the ship in question: Length over all, 440 feet (or 20 feet more than the "Puritan," at present the longest similar vessel); length on water-line, 424 feet; depth of hull, 20 feet 6 inches; depth from top of dome, 58 feet; beam, over hull, 52 feet; beam, over barge, 92 feet. The vessel will be constructed entirely of steel, and will be absolutely fireproof. She will have a double hull on the bracket system, divided into 58 water-tight compartments, which will render her nonsinkable. The motive power will be supplied by 8000-horsepower double inclined compound engines, working side wheels with feathering buckets, and the boat will be fitted with ten Scotch boilers and two smokestacks. The speed expected to be obtained is 22 knots per hour. Accommodation is planned for about 1500 passengers in between 400 and 500 staterooms, while the freight-carrying capacity will be 1000 tons or more. The general design and arrangements are almost similar to those of the "Puritan," with the exception of the saloon, which will be placed on the main deck aft, instead of below. The cost is calculated to reach the neighborhood of $1,250,000, and it is stated that the boat when completed will be far ahead of any hitherto launched for similar service. Work will be pushed on as rapidly as possible, all the resources of the shipyard being used to enable the vessel to take the water by next July, if possible.—Iron Age.

The Masonry of Boiler Settings.

The brickwork about boiler settings is, we fear, often very imperfectly laid. It is mostly done by contract, with no one to supervise it who understands the severe use to which it is to be put. The bricklayer, who may never have worked on a job of this kind before, builds good-looking inside and outside walls but the space between is apt to be filled with odds and ends in the most promiscuous manner. Furthermore, he puts the same joint in that he would use if he were building a house, and this is just what we do not want in a boiler setting, particularly in the fire-brick lining of the furnace. The joints throughout the setting should be thin, and the work should be done as faithfully inside as outside. Some sort of prepared fire-clay is used in laying the fire-brick, and it should be mixed up so thin that it cannot well be used with a trowel. Some millowners who may have had experience in this direction will not allow a trowel to be employed at all, but require the men to use iron spoons. The fire-bricks should be dipped in water as they are used, so that when they are laid they will not immediately "drink up" the water from the cement. They should then receive a thin coating of the prepared fire-clay or kaolin paste, and be carefully placed in position with as little of the kaolin or fire-clay as possible. Every sixth course, beginning with the grates, should be a row of headers, well bonded into the masonry behind. The headers are of little use unless they are well secured into the walls of the setting, for when the lower courses of fire-brick have burst away more or less, we have to rely on these headers to a considerable extent to hold the upper part of the wall in position. In repairing fire-brick linings, the lower courses, which burn out fastest, can be removed and replaced without disturbing the upper part of the wall, provided the headers are secure, while if they are not, the entire wall may have to be rebuilt, and this cannot be done without either removing the boiler or tearing down a considerable part of the setting.—Machinery.

Scientific Progress.

A New Carbon Filament.

Mr. C. Zudeking has recently made an extended series of experiments on the action of the electric discharge on the following gases and vapors among others, viz., carbon tetrachloride, chloroform, carbon disulphide, marsh gas, olafiant gas, and coal gas. All these substances furnish solid deposits. A remarkable fact was observed, which speaks strongly in favor of actual electrolysis. It is that the deposit of carbon always grows out from the positive pole in a way that would indicate its having been separated out at that pole and not mechanically projected against it. The experiment is most conveniently made with coal gas, and the sparking done in a cylinder over mercury. The carbon grows from the positive pole in form of a very fine filament, very hard and very brittle, and possessing most excellent conducting power. The film is very thin, indeed thinner than a horse hair. On examining it under the microscope it is found to be toothed in a very regular way, the teeth being sharp cones projecting towards the negative pole. This deposit could not possibly have been formed by mechanical projection of the carbon. From its character the carbon has not been carried to the pole and deposited there, but is, it seems, a true electrolytic separation. In any other way than this it would be difficult to explain the the dendritic forms. Another thing that speaks against the mechanical projection supposition is that the filament is a mere slender thread. These forms have the greatest likeness to, and remind one very much of, the dendritic forms of metals that grow out from one pole in electrolysis of metallic solutions, and the current in that case seems to act just in the same way as in the gas. Finally, when a slip of stiff writing paper is placed between the two poles, one does not observe, on passing the discharge, a blackening of the side of the paper turned towards the negative pole, which would certainly be the case were the carbon deposited by projection on the positive pole. There is, however, some carbon, in the form of soot that can be easily wiped off, depnsited on the negative pole, though only in small amount. This deposit is entirely different from that on the positive pole both in quantity and quality, and is probably a true projection deposit. Consequently the action of the electric discharge on this gas is not simple, but as might be inferred, almost *à priori*, of complex character. Firstly and chiefly, we have an electrolytic decomposition by virtue of which the carbon is deposited in a well-conducting form on the positive pole; and, secondly, we have the dissociation due to the heat of the discharge alone, which in quantity is by far inferior to the former. By the heat of dissociation, molecules of the carbon are set free and are attracted by both the poles by virtue of their constant static changes.

A TRIP TO A FIXED STAR.—Dr. David Gill lecturing recently on "Fixed Stars," hit upon the following adroit method to illustrate the distance to Centauri. The doctor said, as reported in the Boston *Globe:* "We shall suppose that some wealthy directors, for want of outlet for their energy and capital, construct a railway to Centauri. We shall neglect for the present the engineering difficulties—a mere detail—and suppose them overcome and the railway open for traffic. We shall go further, and suppose that the directors have found the construction of such a railway to have been peculiarly easy, and that the proprietors of interstellar space had not been exorbitant in their terms for right of way. Therefore, with a view to encourage traffic, the directors had made the fare exceedingly moderate, viz., first class at two cents per 100 miles. Desiring to take advantage of these facilities, a gentleman, by way of providing himself with small change for the journey, buys up the national debt of England and a few other countries, and, presenting himself at the office, demands a first-class single to Centauri. For this he tenders in payment the scrip of the national debt of England, which just covers the cost of his ticket; but at this time the national debt from little wars had been run up from $3 500,000,000 to $5,500,000,000. Having taken his seat, it occurred to him to ask: 'At what rate do you travel?' 'Sixty miles an hour, sir, including stoppages,' is the answer. 'Then when shall we reach Centauri?' 'In 48,663,000 years, sir.'"

SPIDER THREAD FOR TELESCOPES.—The ingenious astronomer captures a common garden spider and places him on the end of a twig. Then he startles the spider, who immediately drops toward the ground, throwing out a thread as he goes. The astronomer, when the spider has got a little way down, produces a doubled wire, on which he begins to twist the thread. The spider continues spinning and the astronomer goes on twisting the thread till he has enough thread for his purpose. Nothing remains for him but to break the thread, and when he requires it unwind it from the wire as he would cotton twist British astronomers, it may be added, envy their confreres in Australia, for there is a spider which spins a thread of three cords; the British spider's thread contains five cords and is appreciably thicker.—London Tid-Bits.

LISTERINE AS AN ANTISEPTIC.—Dr. A. Martinez Vargas, physician to the general charity hospitals of Madrid, professor of infantile diseases, etc., writes: "For two years I have frequently employed listerine in external and internal operations without having failed to obtain its antiseptic effect. On account of its agreeable odor, and the sensation of freshness that follows its use, it is a topical application that cannot be surpassed in nasal and guttural affections, and in running from the ears that is so common among children and so offensive on account of its fetid smell. In a case of hay-fever or spasmodic rhino-bronchitis, the intensity of the attacks of sneezing was diminished by treating the naso-pharynx with the listerine diluted and stopping up the nostril with cotton soaked in the pure listerine. Its antiseptic properties, demonstrated as they are, and combined with these its aromatic quality, listerine may be elevated to the first rank as the preferable liquid for the disinfection of the hands, face and mouth when there exists any danger of contagion from diphtheria or any similar affection. On account of its freedom from toxic and caustic properties, it may be used as a domestic antiseptic and utilized for external applications and to meet certain necessities where an antiseptic is required in intestinal disorders." The editors of *The Sanitarian*, who have been in the habitual use of listerine in like disorders to those named by Dr. Vargas, for more than twice two years, agree with him in his favorable opinion of it.

ELECTROLYTIC PROCESS FOR ANTIMONY. According to the *Moniteur Scientifique*, Koepp of Rheingau, Austria, has invented the following process for obtaining antimony from its ores. It consists in treating sulphide of antimony with certain salts of oxide of iron alone or in connection with haloid salts in an apparatus from which the antimony is deposited electrolytically. The trisulphide of antimony is decomposed in contact with ferric salts, sulphur is liberated, and the ferric oxide passes to the state of ferrous oxide, and at the same time antimonious oxide passes into solution. The reaction is rapid, and is complete when it takes place in the presence of free hydrochloric acid, or, better, in the presence of a haloid salt, such as common salt. The following reaction is explanatory: $2Fe_2Cl_6 + Sb_2S_3 = 2Fe_2Cl_4 + Sb_2Cl_4 + S_3$. The antimonial solution freed from the sulphur by filtration is submitted to electrolytic action, and the antimony is precipitated at the negative pole, the iron being oxidized at the positive pole, giving a solution of ferric chloride which can be used for the treatment of fresh quantities of sulphides of antimony. The anode and cathode are composed of lead plate. The bath is heated to about 50° and maintained in constant movement. In order to obtain a compact deposit of antimony, it is necessary to employ a current of 40 amperes or thereabout for each square meter of surface of the cathode.

THE MAGNETIC VARIATION.—During the last 40 years the Coast and Geodetic Survey has made numerous observations for the determination of the magnetic variation at the Presidio station. These observations are made yearly because the variation has now nearly reached its maximum movement eastward. It will probably attain its greatest elongation in 1897. Fremont Morse has just finished a very satisfactory series of the measure of the different magnetic elements. The variation is now 16 deg. 40 min. east. This is a quantity of daily use by our city surveyors.

APYRITE is a new Swedish powder of which the full composition is not obtainable. It is known, however, that nitrocellulose enters largely into it. It is claimed that this powder burns without flame or smoke, is not affected by moisture or heat and can be handled and transported without danger. After 800 shots the gun was still clean. With the new Swedish magazine gun it is said that 3 5 grammes will give an initial velocity of 2080 feet, with a pressure of 2260 atmospheres.

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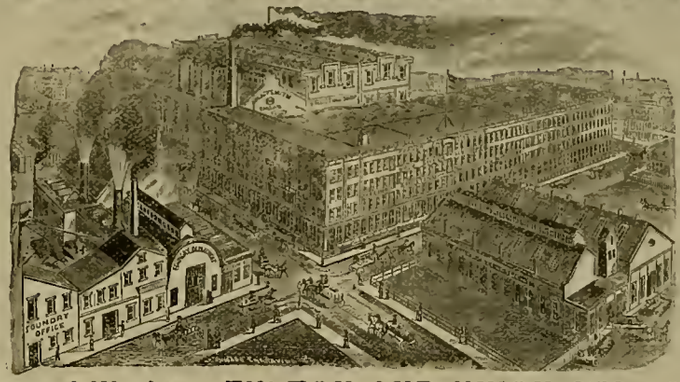

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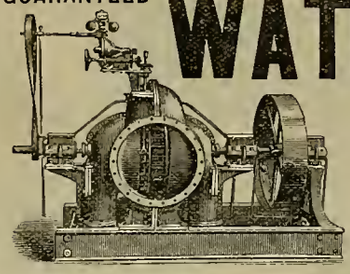

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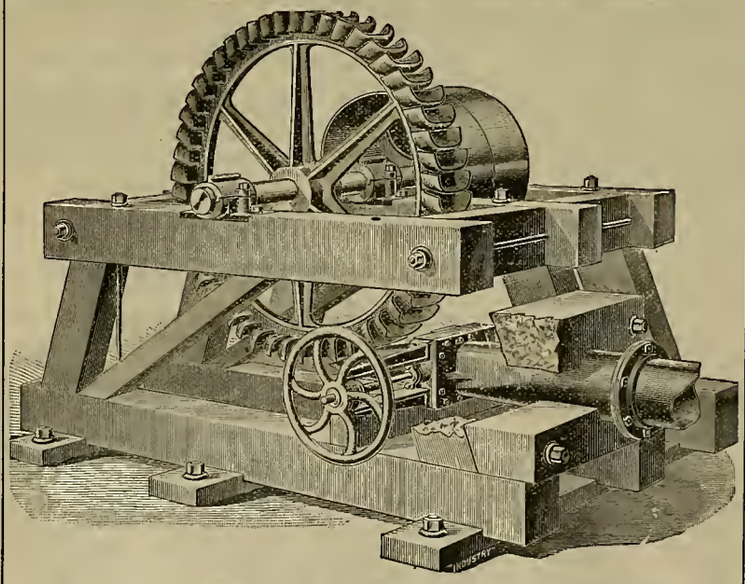

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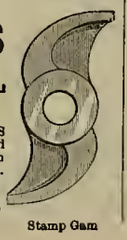

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Useful Information.

WATERPOWER AND ELECTRICITY. — In an article on the subject of utilizing waste waterpower, particularly in the South, the *Manufacturers' Record* says: Throughout this country there are rivers, streams and brooks which can be utilized and give to the cities and towns near them both power and light. In the South there are hundreds of streams, which, if harnessed, would supply all the electricity needed for years to come. Such power would be cheap, and within the reach of all, the farmer as well as the manufacturer. Few people who watch a stream running in its bed think of the good which might be accomplished by the force which is wasting itself, nor do they realize how much power there may be in it. Suppose a stream 12 feet wide, with an average depth of one foot, runs with a speed of eight miles an hour, if a fall of 20 feet can be secured, by means of a flume or canal, 318 horsepower per hour would be developed. A brook which would fill a flume 3x2 feet and give a fall of 20 feet would yield 160 horsepower per hour, and even though the flume be filled only one foot in depth and three feet in width, 80 horsepower will be secured. Five miles from a certain town in Tennessee there is a beautiful stream which falls 60 feet in one leap, and during the lowest water would furnish over 200 horsepower, while in winter, spring and early summer, or at any time after a heavy rain, over 1000 horsepower could be secured. At Mussel Shoals, on the Tennessee river, over 500,000 horsepower could be developed. There is power enough here to operate the Memphis & Charleston railroad from Memphis to Chattanooga and leave enough over to light every town and city along the line. It would be impossible to name every stream in the South which could be utilized in this way. Some are small and some large, but each could be made to serve in some degree.

THE BOTTOM OF THE OCEAN.—There is a common but eroneous notion to the effect that a human body, or even a ship, will not sink to the bottom of the profounder abysses of the oceans, but will, on account of the density of the waters at a great depth, remain suspended at some distance above the surface of the earth. This is an error. No other fate awaits the drowned sailor or his ship than that which comes to the marine creatures who die on the bottom of the sea; in time their dust all passes into the great storehouse of the earth, even as those who receive burial on land. However deep the sea, it is but a few hours before the body of a man who finds his grave in the ocean is at rest upon the bottom; it there receives the same swift service from the agents which, in the order of nature, are appointed to care for the dead, as comes to those who are reverently inhumed in blessed ground. All, save the hardest parts of the skeleton, are quickly taken again in the realm of the living, and even those more resisting portions of the body in time are, in large part, appropriated by the creatures of the sea floor, so that before the dust returns in the accumulating water to the firm, set earth, it may pass through an extended cycle of living forms.—Scribner's Mouthly.

THE HEATING OF STREET-CARS.—Many devices for heating streetcars are now being put on the market, some of the most practicable of which use a modification of the ordinary rheostatic coils placed about the car as radiators. A number of railways in the Northwest are making use of these very satisfactorily, claiming that they keep the cars comfortable during the coldest weather. The latest invention, however, proposes to employ tanks of water, supplied at the carhouse, renewed as often as the water becomes cold. Whether this will prove a practical method of car-heating remains to be seen, but if such a system of hot-water heating is not too cumbersome for streetcars, there is no reason why the heat usually wasted in the rheostat beneath the cars in necessary regulation should not be thus utilized in the car, either by means of a water-rheostat of the kind at present used in factories for testing purposes, or simply by having the rheostat in the car during the cold weather instead of under it.—Street Railway Gazette.

AN ASTRONOMICAL REVIVAL. — Prof. Barnard's recent lecture on Jupiter and Mars before the California Geographical Society has aroused quite an active interest in astronomical studies, and Prof. Davidson is daily receiving letters from amateur astronomers asking him for information as to the best telescopes in the market and where they can be purchased.

UTILIZING SMOKE.—In the carrying out of the recently proposed plan for utilizing smoke, a practical illustration of its value is cited in the fact that several Scotch iron works are receiving an annual rental from a certain gas company for the privilege of collecting the smoke and gases from their blast-furnaces. The smoke and gases are passed through several miles of wrought-iron tubing, diminishing in size from 6 feet down to 18 inches, and, as the gases cool, there is deposited a considerable yield of oil. At one of the smallest of these installations —a Glasgow plant—there are pumped and collected about 60,000,000 cubic feet of furnace gas per day, and on an average some 25,000 gallons of furnace oil are recovered weekly, using the residual gases, consisting chiefly of carbon monoxide as fuel for distilling and other purposes, while a considerable yield of sulphate of ammonia is obtained. In a small way, a small percentage of the British coke ovens are fitted with condensing gear and produce a considerable yield of oil, for which, however, in its crude state, there is but a limited market, the chief use being for lucigen and other lamps of the same description; also for treating timber for railway sleepers.—Scientific Machinist.

STEEL.—In a recent paper on steel, read by Dr. Anderson before the Iron Institute, England, he is reported as saying that when a piece of solid iron is thrown into a pot of molten iron or steel, the solid metal at first sinks, which shows that its volume is less than the melted substance, but soon the solid piece becomes heated, which causes it to expand, its volume is increased, and it rises and floats on the surface of the molten mass. The action is remarked as being the same both with iron and steel, and is exhibited at once on simply throwing a piece of iron into molted steel, when it can easily be seen to go down, a movement which might be thought to be due to the impetus attained by the piece of iron in falling that height, but as a matter of fact, the iron, if placed upon a fork and lowered without any such impetus, would go down; in the course of a few seconds, however, it comes up again and keeps on expanding until the piece of iron is a considerable distance above the surface of the metal, when it decreases in volume, and, of course, becomes of the same volume as the molten metal which it joined.

LIFE OF SHIPS.—Robert Thompson, president of the Northeast Coast Engineers and Shipbuilders' Association (English), says that the average life of an American-built ship is 18 years. The life of an Italian-built vessel is placed at 27 years. This comparison, says the *Maritime Register*, will startle many shipping people, and some may dispute its correctness. It is shown that the conditions upon which the comparison between the two was made have greatly changed and the table has little value now. In the new merchant marine which is being built up in this country, steel and iron largely take the place of wood, and as Americans rank high as expert shipbuilders, it is quite likely that the new vessels will be found to be equal in all respects to those built in foreign yards. The average life of the ships of other nations is given in the table. Those of France are placed at 20 years, the Dutch 22, German 25 and British 26.

DEVELOPMENT OF A "TOY."—A man once invented what the world considered "a toy." Capital, energy and inventive ability pushed the toy up to be "an invention of genius." At the Centennial Exhibition of 1876 the inventor utilized his "toy" for the transmission of speech over a brief distance. Royalty and science applauded. Scoffers claimed a limit to its usefulness, at the same time neglecting the natural American characteristic of progressiveness. Meanwhile, the inventor, assisted by others of ability, toiled in silence and in faith. At the celebration of the 400th anniversary of the discovery of America, the inventor projects his voice along a copper wire 1000 miles long, and his every whisper is distinctly audible at the far end. Conceive, if you can, a more romantic, interesting and wonderful bit of history.—Electrical Review.

ALUMINUM BICYCLES. — Several manufacturers in Europe are now using aluminum in the construction of bicycles, says *Iron*. The aluminum is alloyed with a small percentage of titanium, which is said to increase the strength of aluminum very considerably. The following are given as the results of tests of the alloy and metal used for this purpose. Tensile strength of aluminum 22,300 pounds per square inch; titanium alloy 73,500 pounds. The tensile strength of the alloy is very great if these figures are correct. It is greater than that of wrought iron and steel (48,000 to 67,000 pounds), but is not so great as steel wire, which has a tensile strength of nearly 200,000 pounds per square inch.

CRUSHED sea shells are proving a satisfactory material for pavements in Savannah, Ga. About six miles of the streets of the city are paved in this manner, and it is stated that after the shells are once thoroughly crushed and packed, the pavement becomes almost as hard as asphalt, and that all that is necessary to keep it in good order is a watering once a day and an occasional shovelful of shells placed where it is beginning to wear away. Its durability, even under a heavy traffic, is said to be very good.

GLASS TYPE.—The French newspapers are just now testing a novel sort of type, some made of malleable glass by a new process. The new types preserve their cleanliness almost indefinitely. They are said to wear better than those made of metal, and can be cast with a sharpness of line that will print more distinctly than is possible with the old style type.

ABOUT the last logging that will be done in Michigan, Wisconsin and other lumbering States, according to the *Woodworker*, will be that of reclaiming the millions of feet of sunken logs which now lie in the streams of those States.

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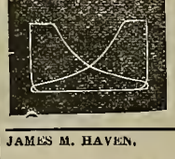

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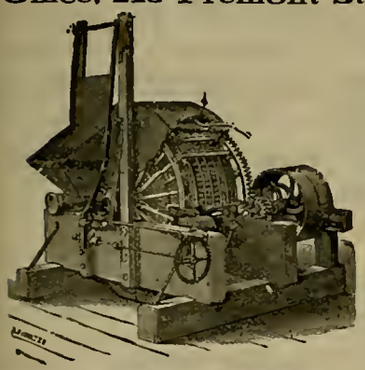

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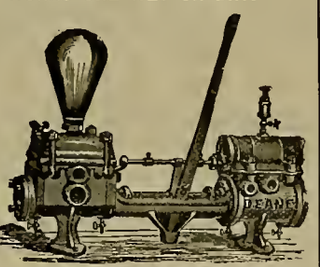

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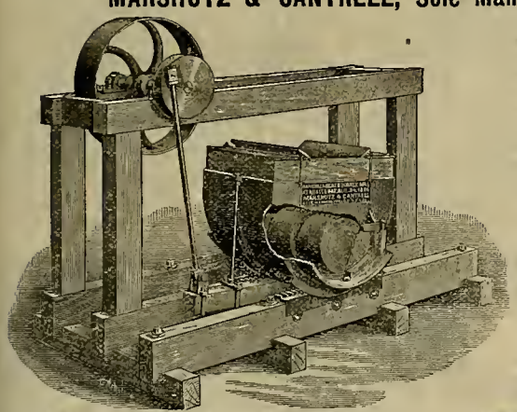

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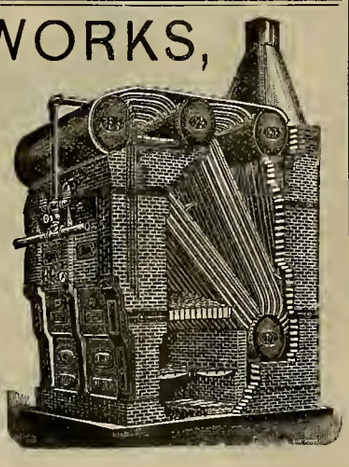

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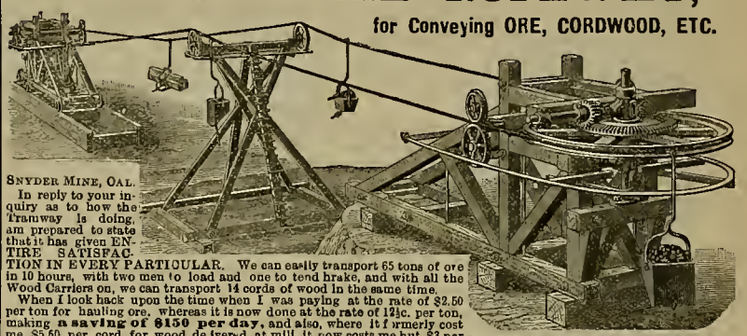

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Storage Battery Street Cars.

The Northern Tramway Co. of Paris is making some bold experiments with storage batteries in that city, the following details of which, from the *Bulletin International d'Electricite*, may prove of much interest:

It is proposed to place 16 cars in service on the two lines, the cars being of the ordinary type and accommodating 52 passengers. The body of each car is mounted on two independent axles arranged on distinct rectangular frames. Each axle is fitted with a motor of the Manchester type giving 10,000 watts (about 13½ e. h. p) when running at 1200 revolution. The E.M F. varies according to the speed, the maximum heing 200 volts. The reduction in the speed is effected in the proportion of ten to one by means of two pairs of wheel gearing, and the efficiency guaranteed between the motor axle and the terminals of the dynamo is 70 per cent. The speed of the motor, and, therefore, that of the car, is regulated by a switch having three handles. One of these allows of a change from high to low speed, the reverse operation only heing possible by the aid of a key, which is not in the possession of the driver, hut is kept at the barrier hy an employe who alone can perform the operation. The ohject of the second lever is to short-circuit one motor at low speed, if, owing to an accident, the use of one of the two must be discontinued. The third lever controls the direction of rotation hy the reversal of the current. Each car is fitted with a Chalou brake.

The accumulators, which are contained in six boxes, are arranged under the longitudinal seats inside the car. They comprise 108 Laurent-Cely cells, each having 12 plates and about 37½ pounds of active material, and presenting a side surface of eight inches by six millimeters (¼ inch) thick. The boxes are closed by india ruhber plates which prevent spilliog of the solution through the jolting of the car. The daily journey of a horse car in Paris is 62 miles, hut by the employment of storage battery cars it is expected that 80 6 miles will be covered hy each car, thus requiring five tons of cells. Each car will carry 2½ tons of accumulators, and as the half-day's work is about accomplished, the car will return to the depot for a freshly charged set. The cells are made by the Societe pour le Travail Electrique des Metaux at Saint-Denis, where they will he charged and transported to the cars on small Decauville wagons having movable platforms. The charging station will contain four steam engines with horizontal cylinders and Corliss gear, of 125 horsepower each, and running at from 70 to 160 revolutions; these will drive Desroziers dynamos of 60 kilowatts. This experiment is due to the enterprise of M. Broca, manager of the Northern Tramway Company.

Electricity in Chemical Industries.

Most of the numerous and various applications of electricity are of such a nature that engineers and the reading public soon become familiar with them, but this is not always the case with new developments in electro-chemistry, as chemical processes, when not secret, are, as a rule, of less interest and of little importance to the public, except in so far as they result in the cheapening of a product. Many people, there fore, do not know the great and important progress which is heing made in this field. The great cheapening in the price of pure aluminium and of the aluminium alloys, for instance, is largely due to electric processes. Electric bleaching is much more common than is generally supposed. Electric processes for extracting metals from ore are becoming of more importance every day, although comparatively little appears about it in current electrical literature. A cable dispatch just received from England announces the discovery of a new electric process for obtaining caustic soda, chlorine, and other commercial chemicals from salt water. It is stated to have heen pronounced a great success hy prominent chemists, and to cost but half as much as the present methods. The dispatch gives no other details, and until it is verified and accompanied by further details, little need be said ahout it here. That such processes are possible, however, is well known to all educated electricians, as they may be performed in any laboratory; it remained only to hridge the gap, which often is very wide, hetween the laboratory experiment and a cheap and practical chemical process. If these difficulties have been overcome, as the dispatch leads one to believe, and if such a saving is really effected, the result will doubtless he not only of importance to the manufacturing chemist, hut also to other industries in which such important chemicals as caustic soda and chlorine are used. The oceans are practically inexhaustihle mines of these products, which are and always will be free to the puhlic; this "raw material" can never be taxed by any artificial protective tariff, and monopolies and trusts for raising the prices of this raw material are forever beyond the control of politicians and legislation. A better source of supply could not be desired. It remains only for ingenuity and enterprise to develop processes for converting this free, raw material into commercial products, which, if this report from England is reliable, appears to have heen accomplished.—Electrical World.

Electric Quacks and Impostors.

In the early days of electrical engineering, when dynamos were invariably painted red, and when everybody thought electricity such a wonderful thing that nothing seemed to be too marvelous to be accomplished by it, many impostors reaped a rich harvest hy making use of the ignorance and almost childish confidence which the public had in new and startling electrical inventions, to force upon them all sorts of trash, claiming for it almost supernatural qualities. The great success which quack doctors have had with their patent medicines is very encouraging to a class of unscrupulous electrical impostors, whose name and reputation have no value to them, and the astonishing amount of confidence which an easily infatuated public has in high-sounding schemes aod claims, which a more conservative class of people tell them are not within the limits of possihility, makes the ignorant and confident puhlic excellent prey for these impostors. One of the achievements in the modern development of electrical engineering might be said to he the very material reduction of the number of such impostors, but as there are still plenty of willing victims left, there is even at present quite a field for such quacks, though it is appreciahly less than it used to be. One of the most striking features of the electrical exhibits in the Paris Universal Exhihition of 1889 was the total absence of the primary battery fiend who claimed to get more energy out of his hattery than was contained in the materials used. Many people who claim to be intelligent seem to think that money is easiest earned with things that are stated to be impossible by those who ought to know. In a case which came to our notice not very long ago, an inventor claimed to have devised a motor whose efficiency was 120 per cent, and he made the regular brake test hefore his capitalists, allowing them to make the readings and calculations themselves, to show that his claims were correct. His capitalists, who thought they had a prize, were at first afraid to consult an electrical engineer about it, fearing he would destroy their hopes, but they finally did so, and were shown by him that the speed-counter which had been used registered double, and that the motor was, therefore, a very poor one. Notwithstanding this exposure, however, the invention was afterward sold to some western victims for a fat little sum. In another case, which has just come to our notice, a quack, who is at present reaping rich returns for his dishonesty from among a class of sick women and ignorant men, is selling a $25 medical cell, small enough to be put into a vest pocket, which he claims will give current by placing it in cracked ice, but the most wonderful part is that it requires only one wire to lead off the current, there heing no provision, not even one ground connection, for the return circuit; the cell is placed on a carpet and the victim in a bed—no better insulation could be desired. If space allowed we might cite many other cases to which our attention is being called almost daily. No one can deny that there are manufacturers of primary hatteries who are doing an honest husiness with cells, the claims for which are not unreasonable, and it is to their interest that attention should be called to the impostors. The opportunities for fraud are particularly favorable in the primary battery husiness, and it is therefore to the advantage of those whose claims are modest but honest, to have the public know that their batteries are really better than those for which such pretentious claims are made. Our advice to the huyer is that when a battery company makes claims that seem unreasonable he had better first consult an electrician and follow his advice.—Electrical World.

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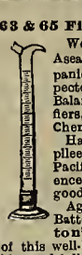
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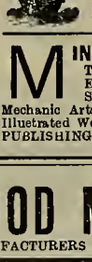
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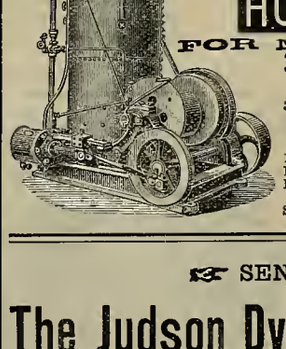
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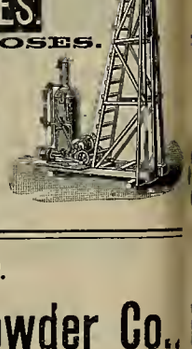

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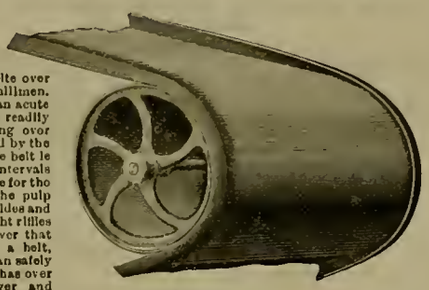

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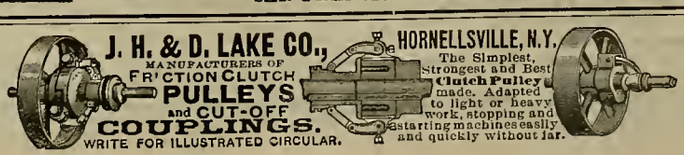

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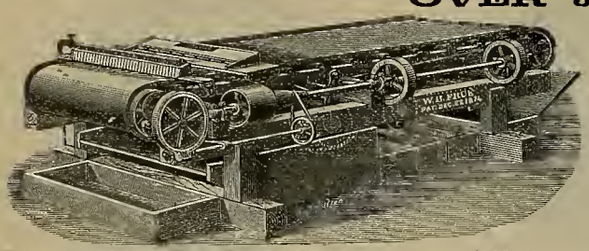

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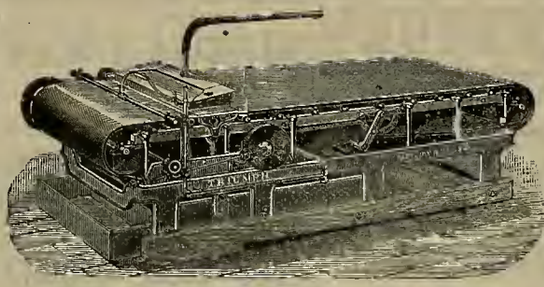

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Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,

Signed) Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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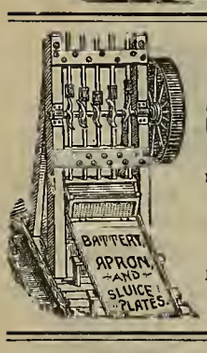

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Nov. 12: Contrary to expectations, sinking has not commenced in the South Eureka as yet, but they think it will be but a short time when three shifts will ba on and the sinking of three or four hundred feet will be pushed with all possible speed. Operations at the Hector have been checked, temporarily we trust. The mill is being run to its full capacity, but it is likely the company will take the water ont to the bottom, as they are very anxious to explore the lower levels, which will enable them to form some definite idea as to the extent of their mine, but will necessarily interfere with the operations of the upper levels during that time. At Belmont the prospects on the 200-foot level are encouraging, and it is the general opinion the deeper levels will make it a paying mine. The Blue Lakes Water Company still has 15 or 20 men employed, mostly at the head of the ditch, engeged in cleaning out and puttihg the ditch in repair for the winter.

Calaveras.

AT MURPHYS.—Cor. Calaveras *Citizen*, Nov. 12: The Beatrice mine, near town, is being developed with e push and energy never seon in mining operations around here before, bnt have had a beckset in the completion of the mill, owing to tha nonarrival of certain parts of machinery. The lengthy tramway leading from the immense ore bin at the top of the hill to the mill on San Domingo, is about completed. The ore thet is now being tuken out is of great mineral value und Mr. Herdy, superiutendent, has highest hopes of the ultimate snccess of his undertaking.

Inyo.

THE DEATH VALLEY COUNTAY.—*California Reporter*, Nov. 11: Messrs. Mack & Kimball have just returned from the Death Valley country, where they heve been doing assessment work on their group of mines, says the Redlands *Citrograph*. The mines are what huve been known in former times as the Goller miues. They have been prospected in a desultory sort of wey, end have always been considered rich. Dr. Mack has become interested with Mr. Kimball, and more thorough exploretion has reveeled many ledges that are rich in gold, silver and tellurium. Assays from the rock rnn very high. Shipments have been made as tests which are highly satisfactory, and steedy work is now expected to be done, and the prospects seem good for the ontput of selected ore to cover ell work of development. This group of mines is sitnated about 150 miles directly north of Redlands and about five or six miles over the line of San Bernardino county in Inyo. They are 80 miles from Daggett by the road. The two best prospected locations are called the Queen of Sheba and the Belmont. They are on the south of Goller canyon, and far np the hill, at the base of which is Mesqnite springs, which efford plenty of weter.

Mono.

THE BODIE CON.—*Miner*, Nov. 11: During the past week east crosscut No. 1, 550-foot level, was extended 7 feet. Upreise from No. 2 north drift 300-foot level, was extended 5 feet. North drift from above upraise was extended 9 feet. West crosscnt, 200-foot level, wes extended 7 feet. We are putting in a new pump-bob fonndation at the 300 Lent shaft; the timbers of the old fonndation ere all rotten.

THE MONO.—During the pest week, south drift, 550-foot level, was extended 10 feet. West crosscut, same level, was extended 9 feet.

Nevada.

GOON LEDGE.—Grass Valley *Tidings*, Nov. 11: The Live Oak mine, in the vicinity of the Lime Kiln, is now getting in fine condition. The mine is owned by some Sacramento parties. Mr. Wm. Werry, the well-known mining man of Colfax, has charge of sinking the shait, and he has sunk 63 feet in the past three weeks. The shaft is a double-compartment one and is timbered in the best manner. The angle of the shaft is 45 degrees. There has been a ledge discovered at the depth of 60 feet, end it shows free gold all through. The country down there is lined with qnertz veins of very large size, and they are easily worked. The company now owning the Live Oak will erect a ten-stamp mill immediately.

A BIG DIVIDEND.—Nevada *Transcript*, Nov. 15: The Champion Mining Company, whose quartz-mining property is located at this city, has just declared a divideud of 50 cents a share. It has heretofore been yielding monthly dividends of ten cents a share, which was doing very well, but now it beats its own record. The last and biggest division of profits among the stockholders is all the more notable when it is known that last month the company expended $17,000 in donbling the capacity of its 15-stamp mill and making other permanent improvements. Thie month it is constructing the heaviest hoisting and pumping rig in the district, and the plant that this is to displace is to be removed to the Merrifield mine (recently acquired by purchase), which is to be reopened this winter by the Champion Company, and which will no donbt be restored before many months to the list of dividend-peyers.

THE HERMOSA MINE.—Grass Valley *Telegraph*, Nov. 15: The Graes Valley Quartz Mining and Milling Company, working the Hermosa mine, held its annual meeting and elected the Board of Directors to eerve e year as follows: Rodger Sheckelton, W. A. Hawley, Thoe. Pierce, Rich'd Connolly, D. B. Marwick. The company has concluded to suspend operations so far es the present shaft is concerned, as the ground is so broken and "thrown over" where the shaft now is that the majority of the company deem it advisable to start another shaft soon. The company owns a large amount of gronud, and the stockholders have not at all lost their grip. In fact, the best miners in the company will stay with it until the last foot is p ospected. The company (all workingmeu) has spent thousands of dollars on the present shaft, and has very few dollers of debt. There will be a few light assessments in future to square up, and then work will be begun on the new shaft.

Placer.

San Francisco, Nov. 14, 1892.

THE MAYFLOWER.—TO THE EDITOR:—Your issue of Nov. 12th contains a report from your traveling egent on the Forest Hill divide. Permit me to say that the report on the Mayflower mine is incorrect. The Mayflower Co. did not yield $87,000 in one week, but it yielded $363,000 in 11 months. The Mayflower Co. has not worked its claim to its south limit The main tunnel is not 4000 feet long, but 5585 feet, and there is not an upward 90-feet-long incline. About the Orono, the company is running e single drift up chennei, first to escertain the value of the gravel; secoud, to drein the ground, which is exceedingly wet. No breasting has been done for nearly two months. The gravel is not of medinm quality. The Orono gravel pays $3.50 per ton when washed through 24 feet of slnices, and $5 to $5.50 per ton when crushed in the mill. The last retnrn of the gravel in the north breast is $14 30 per ton. I wish to know the application of the word "rapids," so profusely used. The assertion that the Mayflower Co. employed 50 men, a majority of them Chinese, is incorrect. The company employs 50 men, among them being 12 to 14 Chinemen. F. CHAPPELLET.

Plumas.

MINING NOTES. — Plumas *National-Bulletin*, Nov. 10: From Chas. W. Hendell of La Porte, a civil and mining engineer of note, we learn thet the mining outlook for thet section and Sierra county is becoming brighter. Several drift mines are operating now, and more will be etarted up in the spring. The Claybank, near La Porte, is owned and operated by an Illinois compeny, with Jes. Lilly, Supt. They now heve a tunnel in 6700 feet. The bedrock is pitching, and the indicetions of soon reaching the pey chennel are good. J. H. Thomas was up a few days ago with eome capitalists looking at mining property. At Thistle shaft, all the winter supplies are in, and the work of driving the main tunnel and gangwaye ahead continnes. They are in rich gravel. At Cedar Grove, 13 meu are employed in the Excelsior mine. The main tunnel is in 1400 feet. At the end of this is an upraise of 35 feet to another tnnnel, which extends 200 feet farther ahead and under 15 feet of gravel. This tunnel is being driven into the hill on the line of the channel. At the mouth of the lower tunnel the company has built a reservoir to husband the water from the mine. Of this property, W. N. Bissette is superintendent. At Wahoo, and opposite the Excelsior, is the Consolidated Golden Era & Suffolk mine, owned by W. S. Chepman and David Moore. Twenty men are employed here, and rich gravel is being worked. The Happy Hollow mine, which e year ago wes supposed to be worked out, has a large crew of men end is taking ont lots of money. From this mine over $750,000 has already been taken out. Mr. Miller is now the superintendent. Out of the old Pioneer hydranlic mine, at Grass Flet, more than $750,000 hae heen extracted. The owners—J. F. Cowdery and Chas. S. Diesen—are opening np the property as a drift mine. They have 15 men employed in running a tunnel, making an upraise for air and sinking en incline. The gravel in this mine is very rich.

Santa Barbara.

BITUMINOUS ROCK.—Lompoc *Journal*, Nov. 11: The bituminons mine on the Hill ranch has ehown such fair developments that Mr. E. B. Hill made up a stock company and had the mine incorporated while in San Francisco not long ago. It is called La Purissime Bitumen and Oil Company.

Shasta.

STAUCK THE LEDGE.—Redding *Free Press*, Nov. 12: The Reid Mines Consolidated Company of Old Diggings, which has been sinking on the old Spanish shaft, in a distance of 15 feet, has come upon the ledge rich in sulphurets. This shaft paid well on the surface, but the ledge petered out in a distance of 30 feet. Now it has come in again. Col. Stevenson is greatly encouraged, as this shaft is being sunk jointly with the Joshua Hendy Co., and will he extended down 500 feet and used as a main shaft through which to work the mines.

IOO NOTES.—Anderson Valley *News*, Nov. 10: Alex. Ludwig commenced Monday to haul the machinery from Anderson depot to the South Fork mining plant. The Bully Choop mines are doing extensive work, and tons of freight pass here every week for these mines. Mr. Ballou of South Fork is doing considerable work for mines in that locality. Wm. Gillon, Phil Martin and Doc Duuham, of the Black Prince mine, at South Fork, are getting out fine ore. W. F. Streater has some good ore in his mines.

Sierra.

ABOUND SIERRA CITY. — Plumas *National-Bulletin*, Nov. 10: Mr. C. W. Hendell, having recently been on a trip to Sierra City, from him we learn that the Young America qnartz mine has etarted ten stamps, with good proepects for a successful run. The Phœnix, below Sierra City, hae also started its mill of ten stamps. Having recently won the snit ebont the wire tramway, Geo. M. Pinney, many years ago well known in political circles, but now of New York, will start up the Mountain mine next spring. It hae a large ledge, and, if properly worked, will pay. The company has a fine mill and good waterpower. At Loganville, it is supposed that the Marguerite mine, owned by Boston capitalists, will be worked again, after suits now pending have been disposed of. The company recently telegraphed H. Barker, the former clerk, to bring its hooks to Boston. He went, and is expected to return in three weeks. A short time since, good quartz was struck in No. 7 tunnel of the Sierra Buttes. The Sierra Buttes mill has been running on quartz from a mine in Gold valley, 12 miles awey, the object of hauling the ore that distance being to meke e test of its value. The Gold Bluff mine, neer Downieville, was recently sold to New York capitalists, who have sent a superintendent out to erect a new 20-stamp mill on the property. The Alaska quertz mine, at Pike City, has been in litigation for some time, but the difficulties are about to be adjusted and the property sold to San Francisco parties. Through the influence of Messrs. Wehe and Van Clief, the owners will put up works to be run hy electric-power transmitted from Yuhe river. Mr. Hendell believes electricity is the coming power in the operation of many of our large mines.

Siskiyou.

GETTING READY.— Yreka *Journal*, Nov. 9: R. C. Crawford has a force of seven men at work near the summit of Scott monntain, at heed of Scott river, in rolling aside large boulders end cutting out roote, so as to be ready in the eerly spring for the commencement of mining, or when the snow does not prevent snccessful working. Mr. C. intends pushing the work of clearing the ground as fast as possible before the winter etorms commence, and as there will be plenty of water in the spring from the melting enow, he will undoubtedly reelize a rich reward for his enterprising efforts in developing a section known to contain rich paying gravel and quartz.

CLEAN-UP.—Yreka *Journal*, Nov. 16: Jas. E. Ironsidee has just cleaned up a crushing of several tons of quertz at his Cherry creek ledge on the divide bstween Yreka and McAdams creek, realizing about $20 to the ton, the qnertz being only such as taken out while doing dead work in sinking shaft and tunneling. When he gets ready to stope, he expects to do much better, and hes quartz enough in sight to yield thousands of dollars. Mr. Barnes, a persevering and energetic miner, elso hus a fine ledge in the seme locality, from which he has taken out some 120 tons to be crushed, and prospecting not less than an ounce to the ton. There are severel other ledges on Greenhorn, Deadwood, Cherry and McAdams creeks, in the seme vicinity, all of which will be worked during the coming winter, when the storms do not prevent. The placer mines on Cherry creek will also be ground-sluiced on an extensive scale, as soon as the snow and reinstorms come to furnish water, as these are dry diggings except during winter and spring.

Trinity.

QUICKSILVER MINES.—Shasta Co. *Democrat*: From Henry T. Bragdon, of Bragdon & Smith, merchants at Castella, we learn that business has been exceedingly good this fall. A pack-train of 35 mules hes been making two trips a week to the Altoona and Boston Quicksilver mines, and the qnartz-mining camp on the line of Shesta and Trinity counties, near the bend of Castle creek. The Integral Quicksilver Mining Co., owners of the Boston and other locations, have their 25-ton smelting furnace nearly completed—in fact, expect to start up the works in a few days. They are now sinking on a body of the richest cinnahar ore ever discovered. The ore hody now being snnk on by the Integral Co. is ahont 20 feet wide. The company intende to put np next summer two or three more 25-ton furnaces, and will employ at least 150 meu in their mine.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Chronicle*, Nov. 16: There has been extracted from all narts of the mine during the week 961 940-2000 tons of ore, which was ehipped to the Morgan mill, the average value of which, per car samples, was $25.69 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $21.03 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $15,537.76.

OPHIR.—1465 leval—We have continued to work north from the drift run south from the Mexican into the Ophir ground, 101 feet below the eill floor of this level, and have extracted and raised to the surface 27 tons of ore, the average assay value of which is $26.50 per ton.

MEXICAN.—On the 1465 level the drift run north from the crosscut rnn east from the bottom of the winze snnk 101 feet below the eill floor of this level, near the eouth line of the mine, has been advanced 16 feet; total length, 285 feet; continuing in a porphyry formation with lines of low-grade quartz.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift, has been extended during the week 27 feet; total length west from the joint shaft 2613 feet; face is in clay and porphyry.

UTAH.—340 level—The north drift from west crosscnt No. 2 has been extended 16 feet; total length, 166 feet, continuing in porphyry, clay and quertz formation.

SIERRA NEVADA.—West crosscut No. 2, from Kenosha tunnel, started from north drift, 800 feet in, has been advanced 29 feet; total length, 337 feet; face in porphyry. The intermediate tunnel has been advanced 23 feet; total length, 115 feet; face in eoft porphyry. In the Cedar Hill drift we have eaved 10 tons of fair-grade ore. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 27 feet, making the total distance west of shaft 2613 feet; the face is in porphyry.

ANDES.—North drift from end of east crosscut No. 1 north was advanced 10 feet; total, 92 feet; formation, clay and porphyry.

GOULD & CURRY.—200 level—The northwest drift, started 435 feet from shaft, has been advanced 14 feet; total length 546 feet; face in porphyry. West crosscut No. 5, in northwest drift, 452 feet from main west drift, has been extended 15 feet through soft porphyry and qnartz; total length, 86 feet. Have also done some repairing in main north drift during the week. On tha Sutro tunnel level, the joint north drift with Savage Co. has been advanced 15 feet; total length, 670 feet. Work was discontinued in the face for three deys, during which time the men did some needed repairing and timbering.

BEST & BELCHER.—900 level—West crosscut No. 2 has been advanced 15 feet; total length, 60 feet; formation passed through, seme as when last reported.

HALE & NORCROSS.—We continne retimbering main shaft above the 900 level. West crosscut No. 3 wes advanced 12 feet; total length, 92 feet; face in hard quartz end porphyry. Advanced mein north drift on this level 20 feet, total length 242 feet; face in porphyry.

CHOLLAR.—We are repairing the north drift, 450-foot level. The east crosscnt, 160 feet south of north line, 930 level, is out 207 feet; face in porphyry.

POTOSI.—The raise from No. 1 crosscut, 1100 level, continues in 2½ feet of $25 ore. The east crosscut, 50 feet sonth of the Potosi winze, 1150 level, is in porphyry and streaks of quartz. During the week we have been enlarging and retimbering 1800 station, Ward shaft. Extracted and sent to mill the past week 309 800-2000 tons of ore from the 550, 980 and 1100 levels. Milled during the week 300 tons. On hand at mill 59 tons, 1200 pounds. Average battery assay, $27.08. Average car semple assays, $27.57.

BULLION.—The west crosscut from north drift, from top of raise from east crosscut, 320 feet south of north line, 1300 level, is out 64 feet; face in porphyry. During the week we have been enlarging and retimbering 1800 station, Ward shaft.

OCCIDENTAL.—From the stopes on 350, 400 end 450 levels we have extracted and milled 175 tons of ore of the average value of $18.55 per ton, as per battery semples. The Zadig drift, Sutro tunnel level, has been extended 14 feet; formation, hard porphyry.

ALPHA.—Dnring the week we have been retimbsring and enlarging the 1800 station, Ward shaft.

EXCHEQUER.—During the week ws have been retimbering and enlarging the 1800 level, Ward shaft.

WAAN SHAFT.—Dnring the week we heve been retimbering and enlarging the 1800 station, Ward shaft.

NEW YORK.—The winze on the 650 level is down 65 feet on the slope; bottom in low-grade quartz. Are taking out from 8 to 10 cars of ore per day, assaying from $25 to $30 per ton. The west orosscnt, 55 feet north of sheft, 800 level, is out 15 feet; face is in porphyry.

SILVRA HILL.— Extracted and milled the past week 115 1640-2000 tons of ore from the 160 and 260 levels.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, Nov. 11: There is little change to report in any of the workings.

BELLE ISLE.—The stopes above the 250 and 350-foot levels are without material change.

NAVAJO.—The stopes above the 350-foot level are looking about as usual. The pump hes been put in order on the 350 station, and pnmping will be resumed dnring the coming week.

Pervine District.

RICH STAIKE NEAR RENO.—*Gazette*, Nov. 12: Cal Sellers was in town this morning with some very rich epecimens of silver ore. He brought them from a ledge that he discovered abont six weeks ago in the Peavine district, 25 miles north of Reno. Judging from the assey made of the first prospect, Mr. Sellers says the ore he has at present will go about $100 to the ton. He has only dng a depth of seven feet, and as the width of the seam increases, he has undoubtedly struck a bonanza and will have no trouble in getting capitel to work it.

Eureka District.

ORE SHIPMENTS.— Eureka *Sentinel*, Nov. 12: The Eureka and Palisade Railroad Company received during the month of October the following lots of ore for shipment to Salt Lake City and other points: Eureke District—Diamond mine, 1196 tons; Eureka Con. mine, 347 tons; Jeckson mine, 93 tons; Phœnix mine, 87 tons; Richmond mine, 81 tons; Bullwhacker mine, 60 tons; Hamburg mine, 46 tons; Williamsburg mine, 16 tons; Dunderburg mine, 14 tons; Delaware mine, 11 tons; and McGeery mine, 11 tons. Total Eureka district, 1962 tons.

White Pine District.

ORE SHIPMENTS.—Eureka *Sentinel*, Nov. 12: The following ore shipments were made last month from White Pine district, White Pine county: From Rocko Kragnazo, 53 tons; C. A. Mathewson, 48 tons; Tom Cornell, 30 tons; J. B. Mathewson, 20 tons. Total, 151 tons.

Ferguson District.

THE CAMP.—*Silver State*, Nov. 11: The latest reports from Ferguson mining district, Nev., are that this new camp is now in the height of its prosperity. The ore-bodies there are holding out well with depth, and new discoveries are of freqnent occurrence.

Montgomery District.

RENEWED INTEREST.—Elko *Free Press*, Nov. 10: Word has been received from Montgomery, in eonthern Nye county, that the interest in that camp is being renewed. A number of

buildings are being erected to be used as stores, dwellings and offices, and large quantities of goods and merchandise are being shipped in. Few men are employed in the mines, for the present, it being the intention of those interested to get other necessary matters in shape for a long and extensive run. Montgomery is in Death valley, and is in the supposed vicinity of the lost Breyfogle mine. No better gold-quartz ledges exist anywhere than in Montgomery district. The assay of an average sample taken from the Montgomery mine gave $31 in gold per ton.

Jackrabbit District.

VOLCANO MINE.—Ferguson *Lode*, Nov. 9: From a letter lately received from Wes Williams of Royal City, we learn that Wes has developed an immense body of high-grade ore in the Volcano mine, in that district. This discovery was made in doing assessment work, and is such a fine showing that a force of men will be immediately put to work to develop the bonanza. Some time in the eighties, Wes refused $10,000 for this mine, and several times since he has been made handsome offers for it, but he always felt confident of proving its worth, and for such reasons never entertained any of the propositions. This late discovery was made in a new place on the ground, at a depth of 12 feet, and proves conclusively the existence of an immense deposit. The ore is a soft carbonate, very heavy in lead, and of a most desirable character for smelting.

ARIZONA.

ANOTHER RICH STRIKE.—Mohave *Miner*, Nov. 12: One of the richest strikes yet made in Minnesota district is reported from the Horn Silver mine, owned by Jas. Smith, Jeff Shepherd, John Mulligan and others. Mr. Smith, while out prospecting last week, discovered a ledge about 30 feet north of the Horn Silver mine, running parallel with that vein, which for size and richness beats everything heretofore found in that locality since the discovery of that camp. The ledge is nearly three feet in width, over two feet of which is solid ore, running on an average from 350 to 500 ozs. in silver per ton, while one foot of the ledge, composed chiefly of rich chlorides, will run away up in the thousands. The boys, of course, are exceedingly joyful over the find, and we hope it may prove as valnable as the present indications would signify, for the boys are all hard workers and richly deserve their good luck. Eugene camp is not a year old yet and the development work on the Horn Silver is very slight, yet we are reliably informed that the owners have refused qnite a large sum for their property. There is quite a number of men in the immediate vicinity of the Horn Silver, all of whom are taking out rich ore, and, as a natural consequence, prosperous and happy. The *Miner* predicts a bright future for Eugene camp aod the hardy miners who have pinned their faith to the prosperity and progression of Minnesota district.

SOUTHERN MOHAVE.—The experts in southern Mohave are making a thorongh examination of all the properties in that section. They will find many good mines there on which to lavish their attention—the Burro, McCracken, Signal and many others. A branch road to Signal from Yucca would be one of the wisest moves a comoany could make should they purchase the Signal properties.

KINGMAN will become the great mining center of the Territory. The vast mining regions to the east, west, north and south will soon ponr in their wealth of mineral to this place for reduction. Narrow-gange roads will be built into the mines of White Hills, Mineral Park and many otber places in the county The vast body of water underlying the town makes it the only place in the conuty snitable for large reduction works.

VALUABLE COPPER MINES.—*Silver Belt*, Nov. 11: We learn from Mr. Oates, superintending the development of a number of claims for the Commercial Mining Co., that he has a splendid showing in the Ingot and Nevada. Considerable work has been done on the Ingot and in the main drift a large body of very rich copper ore was encountered and has been followed for a distance of about 70 feet. The ore-body is apparently doubling back and will be found to parallel the main drift, from which a crosscut will be run to intersect it. The Nevada claim, althongh not so well-opened as the Ingot, is hardly less promising. The shaft is in ore for a depth of 75 feet. The enormous amount of work performed by the Commercial Co. is now beginning to show favorable resnlts, and there is no donbt but that several of their properties will in time become large prodncers.

MONTANA.

FLINT CREEK DISTRICT.—Phillipsbnrg *Mail*, Nov. 10: The Puritan, the latest bonanza mine of the Flint Creek district, continues to improve with each day's development. At the 200-foot level in the west drift three feet of solid ore is now in sight and neither wall is visible. This ore body has developed from what was at first thonght to be only a stringer, and the main vein has not yet been disclosed, thongh a crosscut is under way to reach it. The mine ot the present time is supplying the mill with more ore than can possibly be treated with the 20 stamps in constant operation. The orehouse at the mine is filled with rich rock, and the bins at the mill contain an enormous reserve supply of the rich ore. A 60 foot cooling floor is filled with pulp ready for the pans, and bars of bullion are coming from the retort at the rate of six a week now. Bar No. 31 went to the market in the last shipment. Manager McKechney, who has been east for two weeks, is expected to arrive in a day or two with other members of the company. Soon after their arrival, the site for the new double-compartment shaft will bs decided npon, and the sinking of it will probably be commenced within the next 30 days. The progress of this new company is indeed remarkable, and every indication points to greater advancement and prosperity for a long time in the future. The confidence that the people of Hasmark have in the Puritan mine and the company is shown by the number of new buildings which are being pnt up, and most of them are large, substantial and costly.

NEW MEXICO.

BULLION.—Silver City *Enterprise*, Nov. 12: The Colonial Mining Co., of Mogollon, shipped two more bars of bullion from ore from the Maud S. mine, on Monday. This shipment makes eight bars, with two more ready at the mill to be melted. The bullion is worth abont $1500 each bar, making $15,000 taken out with two Huntington mills in a month. The company is making a large percentage of profit. C. S. Kellum came in from Gold Hill last Sunday, bringing with him 7¾ pounds of melted gold bricks, taken from ore milled from the Engineer mine, which is owned by Mr. Kellum. Harry Logue, who is leasing a part of the mine from Mr. Kellum, has taken out over three pounds of gold from his last mill-run, and will soon make a good shipment. The Engineer is showing up to be a first-class gold mine. On Silver creek the Maud S. mine and mill are working to the perfect satisfaction of the operators and owners. Four bars of bullion, which show a large percentage of gold, have already been melted from their first run. The ore-body in the mine continues to show up well. The Confidence mine is being worked steadily by the lessees, but, on account of scarcity of water, the mill had not been started at last reports, but soon will be, as the first storm of the season will assnre an abundance of water.

LOWER CALIFORNIA.

MARBLE AND IRON AT CEDROS ISLANDS.—*Lower Californian*, Nov. 12: Since the Cedros Island Mining Company's concession to all the mineral land on the island expired, says the San Diego *Sun*, there has been considerable interest manifested in the rich properties which are known to exist there and all of which have not been denonnced thus far. Considering its area, the island is known to be the richest mineral district within the domain of Lower California. Col. Lane, an old Nevada miner, and at present part owner of the Taoama gold mine, about 30 miles east of Tia Juana, holds that the Cedros island mines are the best properties on the southern coast, and that they compare favorably with any south of Alasks. The present company on the island is distinctively a San Diego institntion, and now that a new company, whose headquarters are to be here, is about to engage in mining there, San Diegans will be interested in knowing the real wealth of the island in a mineral way. The mines not only produce gold and a fair percentage of copper, but there are large deposits of marble and iron on the islands surrounding Cedros. The black marble found there is most beautiful in texture and lines, and but for its isolation would long ago have been mined.

OREGON.

THE CRACKER CREEK DISTRICT.—*Bedrock Democrat*, Nov. 10: W. T. Kinsey, who is interested in a number of valuable mining properties in the Cracker Creek district, arrived in the city yesterday morning. The gentleman informed a *Democrat* reporter that the mines of that section never presented a better appearance, and that the large amount of development done this year has had the effect of stimulating the miners in their work of opening up their properties until they have developed into well-defined mines. He is of the opinion that the extensive work carried on this season will be exceeded by that of next year's, and that the progress of the camp will be most rapid from this time on. Mr. Kinsey has a milling-plant on his Silver King property which has been in operation for several months, and reports that everything is working smoothly and he is satisfied with the results. The gentleman departed by yesterday forenoon's train for the East, where he goes on important mining bnsiness.

PROSPECTIVE MINING DEAL.—N. B. Larmour has a deal well under way for the sale of a group of claims in New Leadville district. The prospective purchaser has gone East to submit to his partners the proposition made him by Mr. Larmour and to display samples of the ore. The same parties also wish to purchase a controlling interest in the Vultura.

WILL DO DEVELOPMENT.—Messrs. A. R. Mattoon and G. W. Fought were in the city yesterday, and last evening left by train for the old Straw ranch on Lower Burnt river, in the near vicinity of which is located the Lena mine, owned by Mr. Mattoon and Adam Crossman of this city. It is the intention of the gentlemen to commence active development work on the property at once, continuing operations all winter. They propose to demonstrate the fact whether or not they have a mine.

Complimentary Samples.

Persons receiving this paper marked, are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber please show the paper to others.

SENATOR STEWART and F. G. Newlands, of Nevada, both came here to attend the Miners' Convention. Senator Stewart is an enthusiastic supporter of the Caminetti bill, and the miners also have a firm friend in Mr. Newlands, who has just been elected to Congress from Nevada.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Nov. 17, 1892.

While the local money market is reported to be working close, yet the reserve held by banks is above the average at this season of the year. Exchange on New York is scarce and wanted, which goes to show that remittances are being made with considerable freedom. The demand for Eastern exchange does not come so much from merchants as from railroads and other incorporated companies that have securities at the East and abroad on which interest or dividends, as the case may be, will have to be paid the forepart of 1893. It is quite generally claimed that the requirements from the business community this winter will be less than usual, owing to the trade not carrying so much stock and also to merchants having made closer collections by reason of fears being expressed that we were to have unusually hard times in the near future. Eastern mail advices continue to report fairly easy money markets for the seasnn of the year. The bank reserve, which is moderately large, is being steadily added to. The very heavy imports of merchandise and a falling off in the value of exports, indicates, with all else being equal, a flow of coin to Europe. While the balance of trade appears to be against us, yet it will certainly be only temporary in view of the heavy stocks of wheat and cotton we have which are available for export. Besides this there is a steadily growing demand for American securities, and as this demand appears to be largely for investment, there will be very little arbitrage, which is favorable for a flow of coin to us after the turn of the year.

In trade circles there is a growing feeling of confidence and a more generally expressed opinion that we are entering upon an era of unusual prosperity. What this view of the situation is grounded on, very few are in accord, but the consensus of opinion is that the coming legislation will free the trade of this coast from the high local freight tariff under which business has so long staggered. Merchants claim that the local freights, that is by railroad from this city, are out of all proportion and when reduced within reasonable limits, trade will revive, with our merchants reaching out for a larger proportion of the business now denied to them, owing to comparatively better freights or inducements offered from other large distribution points. Other merchants contend that while the above is correct yet the fact is undeniable that the national election hung like an incubus over general trade, and now that it is past, a revival in business could be looked for in the near future, with a considerable degree of confidence. Continued dry weather is a serious drawback to trade in some sections, but in others it is not felt. The growing belief that Congress will act favorably for the hydraulic mining interest of the State is having a beneficial effect, and if it be fully realized, then the mining industry will forge ahead, and all industries be benefited either directly or indirectly.

The International Monetary Conference will meet at Brussels on next Tuesday. So far our information tends to confirm the general belief among better informed financiers, that the conference will act more favorably toward bimetallism than the most sanguine friend of the white metal had dared to think it would. This change of opinion is based on the growing belief abroad that something must be done to restore silver to its former standing, or else we will enter on a financial and general commercial stringency without a parallel, and that its full effect will be felt abroad and only its vibration visit the United States. This Government has a strong delegation, each member of which is well versed in bimetallism, and will, in consequence, present a strong front. The delegation is strengthened in the secretary to the delegates. The secretary, Dr. Roland P. Falkner, to the delegates from the United States, appears to have been a happy selection, for it brings to the front a man who, by education and training, is calculated to inspire respect, and whose opinions should have weight. Washington advices state that Dr. Falkner was educated at the Wharton School of Finance and Economy, and studied subsequently at Halle, Berlin, Leipzig and Paris. He is the author of numerous monographs on statistical subjects and is editor of Meitzen's great work on statistics, published by the American Academy of Political and Social Science. Dr. Falkner was appointed statistical expert to the finance committee of the United States Senate in its investigation into the course of wages and prices in the United States, and his report has attracted world-wide attention. Dr. Falkner was one of the founders of the American Academy of Political and Social Science, and has been its corresponding secretary since its organization. He is councilor of the American Economic Association, of the American Statistical Association, and is secretary of the American Prison Association. Another happy appointment was that of Thomas W. Cridler, chief of the diplomatic bureau, as the State Department representative of the commission. Mr. Cridler is one of the best informed and most popular of the State Department officials, and will be of valuable aid to the commissioners. As chief of the diplomatic bureau, he is well known all over the world, and consequently his knowledge and acquaintance will be valuable.

SILVER—The market has held barely steady the past few days. The action of the market seems to indicate that operators are waiting for fuller and more reliable advices as to the probable action of the International Monetary Conference. While the opinion gains ground that the conference will act favorably to silver, yet its action not being binding on each nation the metal will continue to fluctuate in value until the leading commercial countries raise it to its former standard. There is a growing conviction with a large class of usually well-informed persons that before the 52d Congress adjourns a free coinge bill will be passed, confining it, though, to the product of this country alone. This, they think, will be done so as to give the prestige of such a measure to Harrison's administration, by which it is thought a strong political point can be gained at the South, in the central States and on this coast. Exports by sea the past week aggregate $67,100 in bullion to Japan.

MEXICAN DOLLARS—The market has held steady at around 67¼ cts. Exports by sea to China the past week aggregate $514 582 The very heavy shipments to China for two months past indicate that dealers in Mexican dollars in that country expect better prices in the near future, and acting on this belief they are importing heavily.

QUICKSILVER—Receipts the past week aggregate 649 flasks. The market is fairly steady at quotations.

ANTIMONY—The market is steady. Eastern mail advices quote as follows in round lots: 11c for Hallet's; 11¼c for LX; 11½c for Crown, and 12c for Cookson's.

LIME—Receipts aggregate the past week 3874 bbls. The market is fairly active at from $1.25@ 1.50 per bbl.

BORAX—Reported receipts aggregate 220 ctls, while the exports by sea aggregate the past week 4030 ctls by sail and 2178 ctls by steamer to New York. The market is steady both here and at the East.

PIG LEAD—The market is barely steady. New York mail advices report an offish market, with consumers indifferent buyers.

TIN—In our market there is nothing new to report. There appears to be a feeling of uneasiness and an indifference to anticipate their wants. New York mail advices report buyers not bidding up for pig for delivery in this year, but for delivery in the first three months in 1893 they bid an advance, going as high as $20.95, without leading to business. London cables report free shipments of plate to this country.

COPPER—The market has been gaining in strength, but with no marked advance in prices. The general tenor of advices from New York and also from abroad indicates better prices later on. Late cable advices from London report as follows: Some undercurrent of firmness has been imparted by advices from Paris of a better feeling there, but consumers buy sparingly although their stocks are low. Inquiries from India have been suspended, owing to weaker market for silver. Adverse statistics, showing smaller deliveries last month than had been expected, restrain outside buying. Furnace material is scarce.

PIG IRON—New York mail advices report a shipment of 250 tons of Alabama to England. If reasonable freights can be secured to England, other and larger shipments will follow. *Iron Age* reports the New York market on Nov. 10th as follows: "From all the leading markets come cheering reports in regard to the situation in pig iron. Sales are not very large, since consumers are pretty well covered for some time to come, but there is no pressure and the recent advance is firmly established. Pittsburg records heavy transactions in Bessemer pig, the aggregate being about 22,500 tons. Most of it has been placed for delivery during the first quarter of next year at $14. Pittsburg, which is now the accepted figure, thus showing an advance from the lowest point of from 30c to 40c ₩ ton."

COAL—Imports the past week aggregate as follows: Nanaimo, 4709 tons; Departure Bay, 4100; Tacoma, 8650; Newcastle, N. S. W., 2405; total, 19,864 tons. The imports of foreign are light. The list of vessels on the way from Australia is quite small, and unless we have heavy rains soon it will not increase unless more money is bid for coal. The imports of domestic coal is not only free, but promise to be large throughout the week. The demand for household coal from the retail trade is increasing owing to colder weather.

Eastern Metal Markets.

NEW YORK, Nov. 16.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38 13-16	84⅜	11 65	3 80	20 60
Friday	38⅜	84⅜	11 70	3 83	20 65
Saturday	39	84⅜	11 75	3 80	20 50
Monday	38⅞	84⅛	11 80	3 80	20 40
Tuesday	38⅝	84⅛	11 90	3 80	20 40
Wednesday	38¾	84⅛	11 80	3 80	20 40

Quicksilver is steady. Pig tin is under manipulation. Copper has a fairly firm undertone. Pig iron continues in good demand. Antimony and borax are steady.

NEW MINING COMPANIES.—The Balaklava Mining Company has incorporated; capital stock, $600,000; directors—Martin Jones, John Henderson, F. C. Mosebach, Sylvester Gardner, T. E. Jewell. The same directors have incorporated the Cosmos Gold Mining Company, with $400,000 capital stock; the Flat Creek Mining Company, with $400,000; and the Bristol Mining Company, with $400,000 capital stock.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb.....	— @ 13½	English, lb.....	— @ 18
BORAX.		Cahon tool.....	— @ 8½
Refined, in car lots	— @ 7½	3/8 Diam'd tool	8½@ 15
Powdered, do...	— @ 7½	Pick & Hammer.	9½@ 10
Concentrat'd, do	— @ 6½	Machinery.....	4 @ 5
All grades jobbing at advance.		Foe Calk.....	— @ 4½
COPPER.		**TINCLATE**	
Bolt	22 @ —	B. V. steel grade	
Sheathing.....	22 @ —	14x20, spot.....	— @ 5 87½
Ingot, jobbing...	— @ 14½	Charcoal, 14x20.	— @ 5 87½
Do, wholesale..	— @ 13½	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28...	— @11 75
IRON.		**PIG TIN.**	
Bar, base.....	— @ 3	Spot ℔ lb.....	— @ 23
Norway, base...	— @ 4½	**COAL.**	
PIG IRON.		**SPOT FROM YARD—PER TON**	
	Spot.	Wellington.....	$8 00
Eglinton ℔ ton	22 00@—	Greta.....	7 50
Glengarnock.....	23 00@—	Nanaimo	6 50
Am. soft, No. 1..	24 00@—	Gilman.....	6 00
Oregon Pig.	—@—	Seattle	5 00
Puget Sound	—@—	Coos Bay	5 50
Clay Lane White.	24 00@—	Cannel.....	8 50
Langloan	22 00@—	Egg hard	12 00
Thorncliffe.....	23 00@—	Cumberland, in sacks....	15 50
Carthcrrie	22 00@—	Do, bulk	14 00
Barrow.....	22 50@—	Wallsend.....	7 25
Carnoffnel.....	22 00@—	Scotch Splint.....	7 50
CHROME IRON ORE.		Brymbo	7 50
Per ton.....	10 00 @—	West Hartley.....	7 50
LEAD.		**TO LOAD—PER TON.**	
Pig.....	— @ 4½	Australian.....	6 00@—
Bar.....	— @ 5½	Liverpool Steam	6 25@—
Sheet.....	— @ 7	Scotch Splint...	8 25@—
Pipe.....	— @ 6½	Cardiff.	5 50@—
SHOT.		Lehigh Lump....	15 00@—
Drop, sizes smaller than		Cumberland.....	13 00@—
B, ℔ bag of 25 lbs....	$1 85	Egg, hard.....	11 00@—
Do do, B and larger sizes ℔ bag of 25 lbs	2 10	West Hartley.....	7 00@—
		COKE.	
Buck, Balls and Chilled do, ℔ bag of 25 lbs.....	2 10	English, to load..	$8 00@ 9 00
		Do, spot, in bulk.—	—@10 00
QUICKSILVER.		Do, in sacks.....	—@12 00
Home trade, pr. flask .....41 50 @42 00		Cumberland.....	9 00@— —
For export.... 35 50 @36 00			

Mining Share Market.

SAN FRANCISCO, Nov. 17, 1892.

The market has been gaining in strength, with quite an advance in the shares of both Potosi and Bullion, and an advance of from 10 to 50 per cent in other shares. The higher prices are largely due to manipulation, for as yet the public is not in it; but signs, toward the close, point to more interest being manifested by chronic traders. Never before were there so many hull points out when prices were low as are now being put out; and these points are backed by news, correct or otherwise, from the Comstock mines reporting more ore, improving prospects and much more which is calculated to inspire the cupidity of the more credulous gudgeons. While the writer believes that prices will go some higher—but how much it is difficult to say—yet it is well for outside operators not to run away with the idea that the inside ring will sell them, unless as a bait, a $20 piece below its intrinsic value, but they would rather follow the "mock auction" plan, and, through cappers and paid tools, get all they can above what it is actually worth. While the move is highly colored, yet the conservative operators should look beyond and not be inveigled into the "spider's parlor." There is not the least occasion for doubting that in Belcher there is a good showing, and that, if the ore is properly milled and all the bullion extracted returned to the company, that quite a reserve fund can be accumulated to help to further develop the property. The same can be said of Ophir and three or four other mines. The showing in these mines is taken advantage of to force the share market up by cross-orders and other means, so as not only to unload the shares they have, but also to short the market, provided the gudgeons are not frightened too soon and stop buying. As soon as this takes place, then the usual heavy declines, dragging market and assessment-collecting can be looked for with the utmost confidence.

Conservative and experienced operators—those who have heat the inside at their own game—look with suspicion on the present advance. While they expect to see still higher prices, yet they look for much lower prices after the inside succeeds in selling all the shares they possibly can. This opinion is largely, if not entirely, based on well-authenticated information that in several of the mines much more dead work has to be done before the properties can be safely placed on a paying basis, and as dead work consumes both time and money, several assessments may have to be levied and collected in the interim. This opinion is strengthened by the way in which the Belcher and Potosi mines are being worked and held up as object lessons. These two mines are made to appear as coming bonanzas and the ore milled is made to give large assays and a nominal difference in the pulp and battery assays. The shares in these two mines are said to be well in hand, and therefore they can be the more successfully bulled without the fear of inviting short-selling from moneyed bears. By bulling the shares in these two mines, the ring evidently expects to be more successful in selling the shares in those which are marked for assessments. By referring to the financial statement of the companies, published in last week's PRESS, a fair idea can be formed of which companies are liable to levy assessments soon. The rise in the market in last September admitted of collecting several assessments, and the coming boomlet or advance will admit of repeating the dose.

The market opened this (Thursday) morning strong with Potosi and Belcher still in the lead. There are persons so evil disposed as not only to insinuate but to say that the person who is said to control the former mine is trying to sell his holdings so as to get more money with which to fight M. W. Fox in his suit against the Hale & Norcross directors. Be that as it may, we know that the points out on the shares in that mine are well out, and that each person has something big in the near future. When outsiders can or do buy, insiders must be the sellers,

Outside mining shares have been flat, stale and unprofitable. More assessments are to be levied soon, which are not calculated to improve matters, either.

Reliable news from the Comstock mines is still scarce, although the street is full of reports and rumors of ore strikes and other big things. While these reports may be correct, yet they are evidently put out to influence buying. Our own advices state that the reported development in Potosi is not a safe gamble for anything big. The ore which is being milled by the company, it is said, is taken out of adjoining mines. The Hale & Norcross north drift, when extended still farther into Savage, will admit of important work being done in both mines. In Ophir they are fooling around what looks like what will prove to be a kidney, yet it may turn out to be a bladder. In Sierra Nevada and also in Mexican they are in interesting ground, yet the work may turn out to be most too interesting for outside shareholders. That high-grade ore can be run into in either of the two mines is generally believed, but whether they will is the question that bothers mining men. In Belcher it is said that the work of developing the ore found on the 300-foot level is naturally slow, owing to the soft and treacherous character of the ground. Careful timberlog is in order, besides ex ra care has to be exercised against water when the ore is run into below the last level drained. The ore on the 400-foot level has not been reached yet, for no water has been struck on that level. In Seg Belcher they are running a west crosscut on the 1300-foot level. Belcher is milling ore, as are Savage, Con. Virginia and Potosi. The other mines do not report milling ore.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOV. 8, 1892.

486,019.—STEAM TRANSMITTER—Baker & Laffaw, Tacoma, Wash.

485,832.—TRANSPLANTER—H. Baldridge, Highlands, Cal.

485,602—PRODUCING STENCILS—W. H. Bell, S. F.

485 828.—VALVE AND FAUCET—A. H. Dauchy, San Diego, Cal.

485,932—MUSICAL INSTEUMENT—A. Gylfe, Sonth Bend, Wash.

485,937.—SCRAP-BOOK—J. V. Houston, Linkville, Or.

485,940.—FBUIT-BLEACHINO APPARATUS—E. Ireland, Winters, Cal.

486,053.—BANJO ATTACHMENT—W. L. Roberts, S. F.

485 663.—WATER-WHEEL NOZZLE—C. A. Scharff, S. F.

485,718.—KITCHEN CABINET—E. F. Smith, Stockton, Cal.

485,998.—CASH-REGISTER—E. T. Taylor, Oakland, Cal.

The following brief list by telegraph, for Nov. 15, will appear more complete on receipt of mail advices:

California—Ellen A. Black, Beckwith, hose-supporter; Frederick W. Dohbel, Purissima, wagon brake; William Filmer, San Francisco, clamps for securing stereotype plates; Abe B. Gunzendorfer, Monterey, cash carrier; Pedro de Nspoles, San Francisco, ore concentrator; James T. Smith, Oroville, safety harness; Horace H. Taylor, Fresno, tray for drying fruit; Cahill & Hall Elevator Company, San Francisco, trademark for operating machinery for passenger and fright elevators.

Nevada—Samuel Emrich, Reno, railway spike.

Washington—George H. Garrison, Sumas City, gun swab; John J. Herring, Seattle, double piano stool; John W. McCorkle, Lexington, lubricator.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CARBURETOR.—Daniel Best of San Leandro, Cal. No. 485,526. Dated Nov. 1, 1892. The particular use of this device is to supply gas engines with explosive vapor. It is adapted for oils of heavier grade than can be ordinarily employed for this and other purposes. In the usual methods of carbureting air, the air is passed over or through a body of hydrocarbon oil, from which the lighter vapor passes off first, leaving the remainder so reduced as to be of no value as a vapor-producer. The principle of this apparatus is to take the heavy oil and pass it in small quantities over or through a mass of material, to thoroughly subdivide it, and then, while in this condition, to expose it to a current of air passed through it. The apparatus consists of vertically disposed concentric tubes, outer, middle and inner, peculiarly connected and related, a metallic packing in the middle tube, a means of supplying hydrocarbon to the middle tube, whereby it passes through the packing and is subdivided, and a discharge pipe for the carbureted air passed through the hydrocarbon. The efficiency of the process is increased by raising the temperature of the containing chamber to obtain a larger proportion of the vapor, which, on account of its greater expansive force than that obtained from the lighter oils, is especially valuable for use in gas engines.

ORE FEEDER.—Ernest A. Langford, of Grass Valley, Cal. No. 485,501. Dated Nov. 1, 1892. This device belongs to the class of belt feeders, in which the endless traveling belt receives the charge from a hopper and carries it forward to the mortars. The belt is made of separate metallic sections, peculiarly fitted and hinged together, so that it is practically indestructible, is self-supporting, capable of sustaining itself and its load in a straight line without other support between the pulleys about which it travels, and presents no openings between the sections as they pass around the pulleys.

BOX-NAILER.—James A. Cain of Markham, Cal. No. 485,530. Dated Nov. 1, 1892. This machine is especially intended for box-nailing. It consists generally of an axially rotary carrier provided with concentric rows of nail holes, a fixed plate below the carrier upon which the nails are supported, a regulatable gate for exposing the nail holes successively and allowing them to drop, a chute for conveying the nails to a holder, a hammer operating in the holder to drive the nails, a reciprocating sash for carrying the hammer, and power-transmitting connections between the sash and the nail carrier, whereby the latter is operated. The whole machine is simple in construction and effective and rapid in operation.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNALS.

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED, DELINQ'T AND SALE.	SECRETARY.
Belle Isle M Co, Nev....	5	10c	Nov 5, Dec 7, Jan 4	J W Pew, 310 Pine
Brunswick Cons G M Co, California	4	2c	Sept 29, Oct 31, Nov 17	J Stadfeld Jr, 309 Montgomery
Bullion M Co., Nevada	40	25c	Oct 20, Nov 24, Dec 14	H Rayson, 331 Pine
Carta M & M Co			Sept 28, Nov 28, Dec 28	C C Coleman, 16 Fremont
Cons New York M Co, Nevada	9	1c	Nov 7, Dec 5, Dec 28	C E Elliott, 309 Montgomery
Cons Pacific M Co, California	14	10c	Sept 29, Nov 5, Nov 30	F E Lutty, 39 Pine
Cons St. Gothard M Co, California	6	5c	Oct 13, Nov 17, Dec 7	T Wetzel, 320 Sansome
El Leopoldo G & S M Co, Mexico	1	10s	Nov 11, Dec 14, Jan 2	Jabez Howes, 330 Sansome
Ev ning Star M Co, California	6	2c	Oct 10, Nov 1, Nov 29	J J Scoville, 320 Sansome
Exchequer M Co, Nevada	34	10c	Oct 28, Nov 30, Dec 26	C E Elliott, 309 Montgomery
Golden Fleece Gravel M Co, California	18	$3	Oct 10, Nov 16, Dec 7	W J Gleason, Phelan Block
Gray Eagle M Co, California	30	5c	Sept 28, Oct 31, Nov. 21	A W Barrows, 303 California
Indian Creek L & M Co, California	3	10c	Nov 4, Dec 14, Jan 5	S O Mills, Mills B'ld'g
Inyo Marsle Co, California	18	5c	Sept 2, Oct 22, Dec 1	A F Thane, 137 Montgomery
Justice M Co, Nevada	54	1'0	Oct 14, Nov 18, Dec 8	R E Keller, 419 California
Kentuk Cons M Co, Nevada	5	10c	Oct 3, Nov 8, Nov 29	J W P w, 310 Pine
Keyes S M Co, Nevada	5	25c	Nov 2, Dec 6 Dec 27	J H Sayre, 328 Montgomery
Louvre Cons G M Co, California	1	5c	Nov 9, Dec 14 Dec 30	J F Hollins, 113 Leidsdorff
Manhan M Co, Nevada	46	25c	Oct 15, Nov 17, Dec 7	C E Elliott, 309 Montgomery
Mono M Co, California	32	25c	Sept 15, Oct 24, Nov 14	H D Walke, 328 Montgomery
North Belle Isle M Co, Nevada	21	10c	Nov 14, Dec 20, Jan 17	J W Pew, 310 Pine
Occidental Cons M Co, Nevada	11	25c	Oct 25, Nov 30, Dec 21	A K Durbrow, 309 Montgomery
Overman M Co, Nevada	65	30c	Oct 5, Nov 10, Nov 30	G D Edwards, 414 California
Russell Reduction & M Co, California	8	1c	Nov 14, Dec 19, Jan 16	J Morizlo, 33 Geary
Savage M Co, Nevada	79	10c	Oct 7, Nov 9, Nov 29	E E Holmes, 319 Montgomery
Sierra Nevada S M Co, Nev	103	25c	Nov 8, Dec 14, Jan 3	E L Parker, 309 Montgomery
South Eureka M Co, Cal	1	2c	Nov 2, Dec 9, Dec 31	A Halley, 328 Montgomery
Teresa M Co, Mexico	9	10c	Oct 25, Nov 29, Dec 16	K J Willats, 307 Market
White Mountains M Co, California	2	tc	Oct 13, Nov 22, Dec 12	S K Nichols, 320 Sansome

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
East Beer and Belcher M Co, Nevada	Annual	C H Mason, 324½ Montgomery	Nov 23
North Gould and Curry M Co, Nevada	Annual	C H Mason, 324½ Montgomery	Nov 21
Occidental M Co, Nevada	Annual	A K Durbrow, 309 Montgomery	Nov 21
Summit G M Co, Cal	Annual	M E Willis, 309 Montgomery	Nov 21

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	5	L Osborne, 309 Montgomery	Oct 20
Scanglon M Co, California	10	T Wetzel, 310 Pine	Sept 19
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Jan 5
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Oct 8
Standard Cons M Co., California	10	J W Pew, 310 Pine	Nov 10

"Footprints in the Sands of Time."

Quarrymen operating in the Portland sandstone quarries in the Connecticut valley, recently blasted out a block 130 feet beneatb the earth's surface that was spotted with very interesting and curious marks. The marks, according to scientific men, are footprints of the *anisichnus deweyanus*, whicb was very common in the valley several million years ago, the beast being a combination crocodile-bird.

It is the opinion of Prof. William North Rice of Wesleyan University, to whom the fossil slab was sold for $100, that at the time the *deweyanus* flourished there was no Connecticut river, but in place of it a bay tbat was 15 miles wide, extending from the sound to tbe border of Massachusetts. In tbat epoch, a good many million years since, this crocodile-bird used to batbe in the bay, then come out of it, sbake himself and gambol awbile on tbe plastic micaceous sand, then on top of the earth; and so be left his mark on it. In time the sand became gelid, tbe world grew over it and now workmen toiling in the bowels of the earth, 130 feet below its surface, come on the playground of the *anisichnus deweyanus*, and a professor studying the tracks imprinted in the sandstone is able to tell just what kind of a creature strode about in the Connecticut valley when Time was a babe. Wonderful, indeed, is tbe eye of science, even when it wears spectacles and follows the humdrum vocation of teacbing the modern dude.—Stone.

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Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 26.		WEEK ENDING Nov. 2		WEEK ENDING Nov. 9.		WEEK ENDING Nov 15.	
Alpha.....	.25	....	.25	.30	.20	....	.25	.30
Alta.....	.25	.30	.20	.25	.20	.25	.20	.25
Andes.....	.40	.55	.40	.50	.40	.45	.45	.55
Belcher.....	2.40	2.85	2.20	2.6	1.55	.40	1.50	2.25
Belle Isle.....	.10	....	.05	....	....	....	.05	....
Best & Belcher.....	1.25	1.85	1.40	1.70	1.35	1.60	1.40	1.85
Bullion.....	.50	.70	.40	.5.	.30	.40	.30	.30
Bodie Con.....	.25	.30	.25	....	....	....	.20	.25
Bulwer.....	.30	....	....	....	.20	....	....	....
Commonwealth.....	....	....	....	....	....	....	....	....
Con. Va. & Cal.....	2 75	3.25	2.85	3.05	2 75	2.90	2.80	3.15
Challenge.....	.60	.75	.55	.75	.50	.55	.50	.70
Chollar.....	.90	.91	.80	.81	.65	.70	.70	.80
Confidence.....	1.90	1.95	1.80	2.00	1.65	1.70	1.50	1.90
Con. Imperial.....	.05	....	.05	....	....	....	.05	....
Caledonia.....	.20	.25	.15	.20	.20	....	.20	....
Crown Point.....	1.15	1.40	1.25	1.50	1.05	1.40	1.00	1.35
Crocker.....	....	....	....	....	....	....	....	....
Del Monte.....	....	....	....	....	....	....	....	....
Eureka Con.....	....	....	....	....	....	....	....	....
Exchequer.....	.15	.20	.10	.15	.10	....	.10	.20
Grand Prize.....	....	....	....	....	....	....	.05	....
Gould & Curry.....	.80	1.15	.80	1.10	.80	.90	.85	1.10
Hale & Norcross...	1.40	1.70	1.30	1.50	1.20	1.40	1.30	1.95
Julia.....	....	....	....	....	.15	....	.10	....
Justice.....	.10	.15	.10	....	.10	....	.05	*.30
Kentuck.....	.10	.15	.10	....	*.15	....	.20	.25
Lady Wash.....	.10	....	....	....	....	....	.10	....
Mono.....	*.25	.30	.25	....	.25	....	.25	.30
Mexican.....	1.15	1.40	1.25	1.45	1.20	1.40	1.25	*1.80
Navajo.....	.15	....	....	....	....	....	.05	....
Nortb Belle Isle..	....	....	....	....	....	....	....	....
Nev. Queen.....	....	....	....	.05	....	....	....	....
Occidental.....	.15	.20	.15	....	.10	....	.10	.15
Ophir	2.15	2.75	2.40	2.85	2.45	2.15	2.60	2.9.
Overman.....	.45	.60	.30	.50	.30	*.50	.60	.90
Potosi.....	.85	1.30	.85	1.15	.85	.96	.95	2.25
Peerless	....	....	....	....	....	....	....	....
Peer.....	....	....	....	....	....	....	....	....
Savage.....	.75	1.0.	.65	.8.	.50	*1.20	1 15	1.65
S. B. & M.....	.35	.50	.30	.40	.25	.30	.25	.50
Sierra Nevada.....	1.25	1.50	1.10	1.35	1.10	1.30	1.05	1.40
Silver Hill.....	.10	.15	.10	....	.10	....	.05	.10
Scorpion.....	....	....	....	....	....	....	....	....
Union Con.....	1.10	1.3.	1.10	1.30	1.00	1.10	1.05	1.40
Utah.....	.15	20	.15	....	.10	.20	.15	....
Yellow Jacket.....	1.10	1.35	1.00	1 25	.85	1.10	.80	1.15

*Assessment added.

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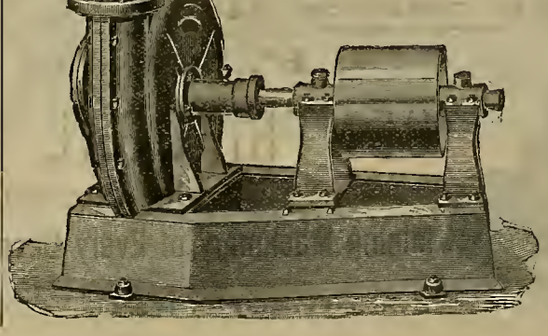

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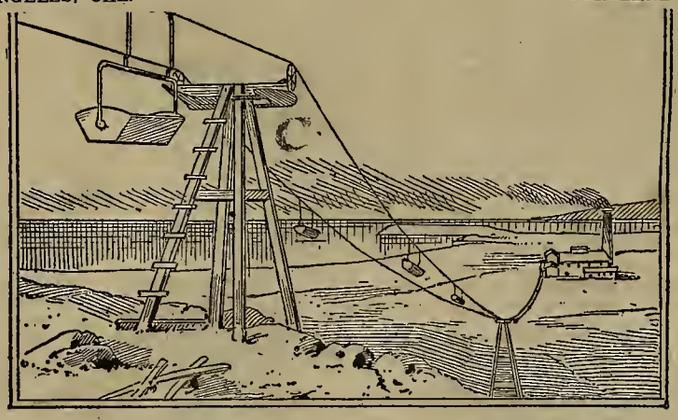

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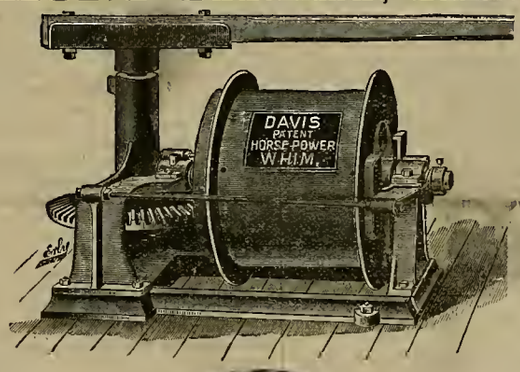

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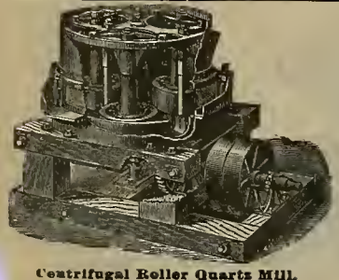

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VOL. LXV.—Number 22.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, NOVEMBER 26, 1892.

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The Hydraulic Gravel Elevator System.

The banks of gold-bearing gravel which are worked in the mining region of this State by the hydraulic process, are washed down by streams of water, under great pressure, being thrown against them through nozzles. One of the problems is to get rid of the tailings or debris after the gold has been taken out in its passage through the sluices, undercurrents, etc. In fact it is easier to find the gravel in place than to find a place for it after it is washed down.

It is this mass of waste material which has brought up the debris question in California, since is has been thrown into the streams and done some injury to them and to adjacent lands. At this time plans are being tried to restrain or impound this debris and keep it from getting into the river. It must be understood that in order to properly work one of these hydraulic mines, means must be provided for the washed-down gravel, dirt, rocks, etc., to be carried away. This cannot be done by hand, the volume being too great. Accordingly, the miner, in working such claims, runs deep bedrock cuts up to the face of the bank, so as to give suitable fall for the water to carry the waste off. In other words, the "dump" must be lower than the bottom of the gravel, which rests on the bed-rock. Without sufficient down-grade from the mine to the dump the mine cannot be worked under ordinary conditions. Sometimes long bed-rock tunnels have to be run (as at North Bloomfield) in order to get this fall, but generally deep cuts in the bed-rock serve the purpose, and in them the sluices to save the gold are placed.

A plan has been devised, however, to overcome some of the difficulties, and this has been applied with success in a number of instances. This is the use of the hydraulic gravel elevator, by which the debris or waste is lifted and run off through a flume. By this means low ground, without fall, may be worked; or, what is more important, the debris can be thrown back into old workings and kept out of streams. Two cuts on this page, made from photographs in a mine, show the application of this system where the mining ground is lower than the dump. One of the views shows a hydraulic giant and its stream of water playing upon a bank of auriferous gravel, and the wash flowing down over the ground to a sump wherein the throat or entrance section of the elevator is securely set. The second view represents the elevator in place, with its outer discharge flume conducting the washed material of earth, sand, gravel, etc., to a final dumping point.

WORKING A HYDRAULIC MINE ON THE ELEVATOR SYSTEM.

THE DEBRIS FROM A MINE PASSING FROM A FLUME.

The principle upon which the operation of these hydraulic gravel elevators is based is the simple fact, which is well-known by hydraulic miners, that water and gravel can be driven uphill by hydranlic force, and that in a flume it is only necessary to give the impelling water more velocity to make it carry more earth or gravel before it. Miners, to accomplish this, give their flumes more grade. It is, therefore, only necessary to give water more velocity than it has through an ordinary flume to make it acquire sufficient force to carry gravel up an inclined plane. This fact suggested the construction of a form of machine which should so direct and confine the inherent hydraulic force of a stream of water as to impel before its power masses of earth or gravel or other heavy material, and the cuts here presented illustrate the features of the machine devised for the accomplishment of that purpose.

[*Continued on next page.*]

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Our latest forms go to press on Thursday evening.

San Francisco, November 26, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Carbolineum Avenarius—Carbolineum Wood Preserving Co.
New Books—Henry Carey Baird & Co., Philadelphia, Pa.
Position Wanted—Wilton E. Darrow, Sonora.
Assessment Notice—Gould & Curry M. Co.

See Advertising Columns.

Comment.

During the past few weeks, a number of plans for restraining mining debris have been given or sent to the editor of the MINING AND SCIENTIFIC PRESS, with the request that they be submitted to the consideration of the State Miners' Association or its executive committee, with a view to their adoption. In each case reply has been made that the Miners' Association is formed to urge and obtain legislation favorable to hydraulic mining, but has nothing to do with the details of methods of restraining the debris. It should be remembered that a commission of U. S. engineers was appointed by Congress, at the request of the legislature of California, to investigate this debris problem and report a remedy for existing evils. In their report to Congress they recommend a system of restraining dams. On the basis of this report, the miners formed their organization and brought their cause before Congress. Thereupon a bill was drawn up and presented, which provided for the construction of such dams and restraining works, the whole, however, to be upon the plans and under the supervision of the U. S. Commission. This bill has passed the House and is now pending in the Senate. It would be manifestly improper for the Miners' Association to offer to the engineers any plans or systems for restraining the debris. They know what is wanted and know best how proper restraining works should be built. The Miners' Association has no desire to interpose and make suggestions as to methods to be adopted. Therefore it has never considered any plans and would be slow to recommend or indorse any. The plans submitted to the editor, as stated, have not been thus far of a practical character. They have in every instance been designed by people who are not miners, and who have no detailed knowledge of hydraulic mining. In fact, most of them show an entire ignorance of the main difficulties to be overcome. The U. S. engineers, who will supervise such works, are the proper persons to consider plans, and doubtless they have already received more than they have any use for.

The State Miners' Association of last week, though less important than that of last January, was more satisfactory to the quartz and drift miners, in that it considered matters relating to their branch of the gold-mining industry. A movement has been commenced looking to remedies for the defects in the existing mining laws. When these matters are brought to the attention of Congress, backed as they are by such a large association of practical miners, they cannot be pigeon-holed and ignored. As to the hydraulic-mining issue in the convention, it was in the main satisfactory; and had the meeting been held two weeks later, there would have been no friction whatever. That is to say, the heat of a political campaign had not yet entirely gone, and opposition to some measures savored slightly of politics. However, this will pass off and sober judgment prevail in time. The executive committee of the association is a conservative body, and will try to so conduct affairs that the miners' interests will be served without any other being injured in any way.

It is very probable that within the next year or two there will be a very decided revival in the gold-mining regions of California. This State is still the leading producer of gold in the United States, and its capacity can be readily doubled by suitable efforts. The nation needs the gold, and the mines of this metal are more and more in demand. Silver is rather too plentiful for its own good, but gold is getting scarcer. Here our placers are practically exhausted, but the gold-belt of the State is very extended in its area, and there is plenty of room for people to develop the mines. Men with good claims will find it easier to dispose of them in the future, particularly if they are in any forward state of development. Quartz is worked here cheaper than anywhere in the world, and there is plenty of it. More capital is, however, needed in the business, to open the mines and equip them. But there is good inquiry for developed gold mines, and this is bound to increase. Then, too, there is every sign that some means will be found to permit the hydraulic mines to be worked, and these should add from six to ten million dollars to the annual output of the State. With most of these mines again at work, our total gold product would again attract attention and cause still more mines to be opened. These are the signs of the times, and they are hopeful ones to the California gold-miners.

Mineral Lands in National Parks.

In all the Pacific Coast States and Territories where the Government has reserved large tracts of land for any purpose,—mainly for the Indians—there has been more or less trouble keeping settlers out. Both agriculturists and miners want to get into such tracts and utilize the lands. Of late years the Government has adopted the policy of reserving as national parks such sections as have remarkable natural wonders or exceptional scenery, and this greatly adds to the area of the Government reservations. Where such parks have been created after the region has been partly settled, certain injustice is done to those who had made homes or opened mines within the boundaries. We have such a case in this State in the Yosemite National Park. The Government set aside nearly a million acres in the Sierras, and within this area no one may take up land whether mineral, timber or agricultural.

This Yosemite reservation of nearly 1512 square miles, or of 976,000 acres, has 36,111 acres known as the Yosemite grant, which is owned by the State of California, is located within the boundaries of Fresno, Mariposa and Tuolumne counties. The southwest corner of the park is within four miles of the town of Mariposa, the county seat of that county. Some mountain ranches on this area have been cultivated for forty years. About one-third of this vast area is known to be mineral in character. Of this area over five townships, aggregating more than 100,000 acres, are in Mariposa county in the gold mining belt of the foothills and embrace many mines which in years past have yielded enormous returns, and whose prospective values can only be approximately estimated. That portion of the park in Fresno county includes the Minarets and South Fork district, tributary to the San Joaquin, a rich mineral country only partly developed. The miners of this State are anxious for Congress to amend the Park Act so as to exclude from its territorial jurisdiction all lands known to be mineral in character, so that mining may be carried on in conformity with the laws and usages of mining districts the statutes of the U. S., and the settled policy of of the Government. Congressman Caminetti introduced a bill in Congress curtailing the area of this park by about 400,000 acres, leaving 600,000 acres. The present area comprises not only the forests and watershed country of the Sierras, with many picturesque valleys, but a large mining district, with over 200 mines, many of which are now being worked. It includes seventy-five or a hundred actual farms, and these settlers can demand either their land restored or its purchase by the Government at a price as fabulous as they may demand. The Sierra Club of this city has denounced this bill, but Mr. Caminetti explains that the present conditions do great injustice to his constituents in Tuolumne, Merced, Fresno, Mariposa and Kern counties. In all probability Congress will act so as protect the settlers and miners. At all events the possible mining area of this State should not be curtailed. There is too much of that sort of thing already without the Government going into it wholesale, and keeping back several hundred thousand acres of mineral land simply for people to look at and not use.

On the Well Recognized Mineral Belt.

Some of our contemporaries in the valleys are needlessly worrying themselves over a resolution passed by the second Miners' Convention, which asks Congress to pass an act recognizing certain lands as mineral, until the contrary is clearly shown. The resolution reads as follows:

Resolved, That the interest of the gold-mining industry of California requires that Congress should pass an act the force and effect of which shall be that all *lands which have ever been returned by the United States Surveyor-General as mineral in character, or lands within the well-recognized mineral belt*, shall be presumed so to be before the Land Department until the contrary is clearly shown, and that the chairman of this convention be requested to appoint a committee of five to draft such legislation as will reach the wishes of the miners of California upon this subject, report the same to the executive committee of this association for their adoption, and that the same be transmitted to our Senators and Representatives in Congress.

The italics in this paragraph are ours, and the words are thus emphasized to call attention to the fact that the proposed act refers only to a special class of lands, and not to all lands. Certain tracts have been returned to the Surveyor-General by his deputies as mineral, and therefore should be so considered until the contrary is proven. A recognized mineral belt is readidly designated as a place where mining is going on, as in Nevada, Placer, and other mining counties of the State. Any such change as is proposed would not affect in the slightest degree the agricultural counties or regions in many counties better adapted for agriculture than mining.

Surely the miners of the State have some little rights which might be recognized by the departments. The Government reserved the mineral, both from the State and from railroad grants. By so doing it showed an intention of having it utilized by the miners. But under present rulings much of this mineral land is passing from the domain of the prospector into the hands of railroad companies and of ranchers, for whom it was never intended. If an agriculturist can prove that certain land on the mineral belt is no good for mining, he can get it. Under present rulings even when on a mineral belt with mining going on near by, the miner is forced to prove the presence of paying mineral, or else the agricultural claimant walks off with the mines and all. This is manifestly unjust. The miners do not want any additional legislation for agricultural regions, but do want some for the mineral belt which will give them an opportunity to prospect and develop the mineral intended for them by the Government.

There is now no definition of what is mineral ground and what is not. Under present rulings a man can only prove valuable mineral after he has worked his claim out. What is ahead of him, on his claim he cannot prove, though he is called upon to do it by the Department rulings. This seems absurd, and is absurd, but it is a fact. The miners simply call for some just recognition of their rights, which under present conditions they do not get. The farming community has plenty of chance to get agricultural land without entering the miners domain and fencing in the minerals. No harm could be done to any farming interest by the passage of such an act as referred to above; while much good would result to the mining interests of California.

The Hydraulic Gravel Elevator System.

[*Continued from preceding page.*]

An inclined pipe is connected with the flume and one end led to a "sump" or depression in the ground. The open end of the ground section of the pipe is concave in shape, or a lower half-section of pipe flaring outward, into which the earth, sand, gravel, etc., are sluiced by hydraulic giants; the elevator entrance and throat sections are set in a chamber excavated below the bedrock surface. The material sluiced into this entrance is taken up by the stream issuing from a fixed hydraulic nozzle, which, by its impinging force, impels it forward and upward through the pipe to its point of discharge into the open flume above, whence it is carried away through a line of sluice-boxes to a final dump. Confined as this material is, within this tight iron pipe, it is necessarily impelled forward with the velocity of the stream itself, and as each particle of gravel or other material is directly acted upon by the full force of the stream discharged through the hydraulic nozzle, it is considerably disintegrated by this action, as well as by the friction along the pipe in its ascent, and the pulverization is complete.

Of course it costs more to work a mine on this plan than on rough hydraulicking. A great deal more water must be used, for one thing, for there must be a nozzle for the elevator to force the water up, as well as a separate one to wash the material down from the bank, and each of these nozzles must have a supply of water under pressure. But by using this system the vast areas which have been piped out in the past can be utilized as reservoirs for impounding the debris from the remaining banks. This system has been adopted in this State, Colorado and Montana, mainly for working ground too low to provide suitable fall, but as stated, it can also be used, where circumstances favor, for working mines where the debris can be thrown back into reservoirs and kept out of the streams. It should be stated that the waste water is also forced up with the gravel and debris; though sometimes an injector, also operated by water, is used to lift this waste water to the flume that it may flow off.

Coast Industrial Notes.

NEARLY all the whalers have arrived from the North, only three more of the fleet being now due at this port.

THE people of Vallejo, by more than a two-thirds vote, have decided to issue bonds to the sum of $250,000 to build new waterworks.

THE steamer Emily brought down this week the first consignment of shingles from the big shingle mills lately started up at Trinidad, on the North coast.

WITHIN a month the cars of the Metropolitan Railway Company will be running to the grounds of the Olympic Club, on Carl street near Seventh avenue.

THERE is considerable activity in Southern California over mining properties and the chances are very favorable for considerable development being done during the coming year.

STATE Prison Directors De Pue, Hayes, Devlin, Sonntag and Neff audited bills for supplies to San Quentin amounting to $13,695.53 at their last meeting and approved bills for the new jute mill of $2,259.27. The purchase of 300 tons of bitumen for use in paving the new jute mill and the warehouse was ordered.

THE Paraffine Paint Company has been awarded the contract for coating the piles at ferry slips 3 and 4. The contract price is 35 cents a lineal foot. The company is to give a bond to the Board of Harbor Commissioners in $5000 guaranteeing the efficacy for five years of the coating. About $50,000 will be the total cost of the work.

IRVING M. SCOTT, President of the Union Iron Works, is getting ready to leave for Washington so as to be in the capital of the nation before the 15th of next month, on which day the bids for the construction of a new line of battle-ship of 9000 tons and one 8000-ton cruiser will be opened, and the contracts for their building awarded.

THE steamer Noyo came in from Fort Bragg Tuesday having in tow the fourth big lumber raft launched at the Fort. The first of these rafts broke up after launching and was brought down here by installments; the three others have arrived safely. The one which was towed in Tuesday contained about 1,500,000 cubic feet of lumber.

THE Atlas Iron Works, at the Potrero, have decided to rebuild the works that were destroyed on the 7th inst. The loss by the fire exceeded $70,000, and over 150 workmen were thrown out of employment by the conflagration. The delay in liquidating the insurance prevented an earlier decision to rebuild, but the work is now about to be begun.

From Superintendent Houda of Korbel, the Blue Lake *Advocate* learns that iron enough is now on hand for six miles of track on the Canyon creek extension. Three miles have been completed and trains are now running over the extension. Seventy-five men are employed on the railroad and grading will proceed without unnecessary delay. W. X. Miller has charge of the piledriving for the company. The Humboldt Lumber Mill Company have forty-five men in the woods at Korbel.

WORK on the new armored cruiser Olympia has been expedited to the utmost since she was launched on the 5th inst. Only the detention of plates by the Homestead strike can prevent her being towed over to the Government navy-yard by the 15th of June, 1893, which will be in advance of the time called for by the contract by several months. The engines are now in position, and next week the ponderous boilers will be placed in the hull. The Olympia looms up in magnificent shape, and looks larger in the water than she appeared on land.

A boat to trade between Scotia and South Fork on the Eel river, Humboldt Co., is being built by Kneass of this city. She will be 40 feet long, 9 feet beam, drawing 9 inches light, and but 15 inches when loaded. She will be able to make 8 miles an hour in still water. She will be supplied with 15 horsepower engines, and will cost $2,800. She will be brought up on a schooner, taken to Scotia on the cars, when she will be baptized in fresh water. There can be no reason why such a boat if started and run in connection with the ocean steamer entering the mouth to Port Kenyon, should not form a most important feeder.

THE Fish Commissioners' steamer Albatross is under the large derrick at Mare Island, and has had her main and auxiliary boilers, smokepipe and steam drum removed. She is to receive two of the boilers originally intended for the Monadnock. Her machinery is to receive a much-needed general overhauling. She is to be given two new propellers of composition instead of her castiron ones, and work on them has already been commenced in the foundry. The prospects for the employes in the steam engineering department for the coming four or five months is quite bright, and employment will be steady for all during that time at least, and then—

L. W. BUCK, president of the California Fruit Union, came down from Vacaville. In an interview with a reporter, he said: "The shippers received good money for their orchard products during the past season. While some lots brought poor prices, the general average was good; and the growers are well satisfied with the result. We did a large business, and California fruit found its way into all the retail markets of the East. We shipped 1700 carloads of twelve tons each, making 20,400 tons, delivered at our different agencies. This is 400 carloads in excess of the shipment of any previous year. The stockholders will hold a meeting for the election of officers in this city on the third Wednesday in January."

REPAIRS having been completed on the keel of the Mohican, she has been taken out of the stone dock at Mare Island and hauled in alongside of the quay wall. Orders having been received to proceed with her repairs, mechanics are now at work upon her boilers and machinery. Five of the boilers are to be retubed with iron tubes, it being impossible to secure enough new composition tubes for the purpose, and the time allowed not admitting of piecing out the old ones. The necessary repairs outside of boiler work are comparatively trifling, being confined mainly to reparing various cocks and valves, renewing copper pipes and putting new feathers in the intermediate shaft for the after-clutch coupling. The same accident that caused the injury to the keel broke two large steam escape pipes, and they will be replaced by new ones. All the repairs will be completed in a short time, and the Mohican will then be ready for sea, and in as good condition as ever.

THE California Starch Company was organized at Petaluma last week. The capital stock is $200,000, divided into 2000 shares at $100 a share. The directors outside of Petaluma are: John M. Streining, Edwin C. Austin, John Burkart, Henry J. Summer, and Hayes and William J. Adams, all of San Francisco. The proposed factory will be of inestimable value to the producers around Petaluma. Potatoes are grown in great abundance in Sonoma county, and a ready market is assured the farmers. After the potatoes have passed through the factory a pulp remains which is good for cattle food.

THE bids for the completion of the Cascade Locks, Oregon, were as follows: Oscar Huber, Spokane, $1,679,540.41; Dickinson & Co., Tacoma, Wash., $1,525,303.00. N. J. Blagen, Portland, Or. $2,305,882 00; J. G. & I. N. Day, San Francisco, Cal., $1,519,765 00; C. D. Vincent and John Mahoney, San Francisco, Cal., $1,997,212.25. J. P. M. Phillips, et al., San Francisco, $1,799 598 87 To these figures $175,000 for contingencies such as inspection, overseers, etc., must be added, so that there will not be much, if any, saving under the contract system. The trouble heretofore has been that Congress did not appropriate the necessary sums to push the work, but doled out miserable pittances, just about sufficient to pay for the damages wrought by the elements during the winter season. Had the estimates of the engineer officers been approved and appropriations made accordingly, the great canal would have been completed years ago.

MESSRS. STEVENOT & DUHRING are organizing a chemical company in Sonoma, and now have upward of $1000 subscribed. At present there are only two chemical works in the United States that manufacture chrome. One is located in Baltimore and the other at Philadelphia. Both are purchasing the chrome iron ore in California, as it cannot be found in any other part of the United States except on the Pacific coast. This ore is to be found in abundance in Sonoma county and in fact in half the counties of the State, therefore works of this kind cannot fail to be more profitable here than those established in the East. Chrome is used for dyeing purposes, for the manufacture of colors, for electric batteries and a number of uses in the arts. Besides the total production by the Baltimore and Philadelphia works, nearly 1,500,000 lbs are annually imported from Scotland into the United States. Price of chrome in New York 10½ to 11 cts per pound; in San Francisco 13 cts per pound.

THE new Vandercook-Sessions line of electric railway which started up in Oakland this week is about seven miles in length. Starting at the corner of Eighth and Broadway the line runs east on Eighth street to Clinton Station, then on Fifth avenue to east Eighteenth street where a branch runs to Fourth avenue and out on that avenue past Peralta Heights, Merritt Park, and Lake View to Oakland Heights. At the end of this line an attractive park and resort are to be fitted up. At Fifth avenue and Eighteenth street another track runs east on Eighteenth to Commerce and out on the last named street to the powerhouse and car shops, at the intersection of Twentieth. Here transfers to the Highland Park and Fruitvale lines will be given. At the junction of Eighth avenue and Eighteenth street another branch will run out on Eighth avenue to East Twenty-fourth street, and along the latter street to Eleventh avenue, from which point it will be still further extended very soon. All of the appliances are of the latest design, the cars comfortable and of very handsome appearance. The remotest point on the lines can be reached for a five cent fare, with transfer arrangements as indicated above.

COLONEL E. G. WHIPPLE of Eureka, formerly editor and one of the owners of the Humboldt *Daily Times*, is in the city, with several leading men of Humboldt. He and the entire delegation were especially gratified over an award of Chief Government Engineer Mendell and Assistant Engineer Heuer last week. It will be remembered that after a long struggle the people of Humboldt county managed through the recommendations of the Government engineer and the California delegation in Congress to have Humboldt harbor placed in the list of those throughout the country requiring $1,750,000 to complete the harbor improvements. This, though not an appropriation, is considered equivalent to it, and yesterday the contract for all of the work was awarded to J. C. Bull, Jr., of Arcata, and he will take hold of the work of extending the two jetties immediately. "The awarding of this contract means a great deal for Eureka and Humboldt county," said Colonel Whipple. "From $50,000 to $100,000 will be expended in the way of wharves, scows, etc., at once, and a large force of men will be employed continuously till the jetties are completed. It means that $1,750,000 is to be expended there. I suppose it will take five years or such a matter to finish it."

WORK on the dam for the Nevada County Electric Power Company on the South Yuba river is being rapidly pushed ahead, and there is no danger now of the structure being damaged by the winter floods or spring freshets. Dr. H. H. Clark, the treasurerer and general manager, has been in Grass Valley, says the *Tidings*, and he is gratified at the progress made. Victor Dorsey has made some excellent photographs of the work done, showing that the heavy timbers have been laid. The dam will be constructed upon the principles of an inverted Howe Truss bridge. The lumber for the flume has been ordered, but as it is a difficult matter to get the lumber in place, the work of building the flume will be necessarily slow. A large amount of blasting will be necessary to secure proper foundations for the flume. The machinery for the plant has been ordered and the company has received notice that the manufacturers cannot supply the same before April next. By this time the dam and flume will be completed and it will take but a short time to place the machinery in position and run the wires to this city. The company has already secured some contracts for furnishing power, but some of the mineowners are rather "backward in coming forward" with their estimates of the amount of power needed. The Gold Hill mine has secured 100 horsepower, and it is thought that 50 horsepower more will be needed.

SEVERAL applications for street railroad franchises came before the Supervisors in this city at their last meeting. Five applications were acted upon, two of them being extensions of lines now in operation, and the others new enterprises. The number of streets sought to be secured for railroad purposes have a length of many miles over sand dunes, and down valleys to the shore. The application of Marc W. Connor, John O'Ryrne, E. Avery McCarthy, Raymond A. Perry, W. A. H. Connor of San Francisco, and Charles McCarthy and D. H. Austin of New York, for a franchise was passed to print. The right of way asked for commences at the intersection of Circular and San Jose avenues, and continues thence over various streets to the ocean house road, and thence westerly to the ocean. There will be a branch running from the intersection of Masonic avenue and Page street to Ashbury street and Caselli avenue. Other branches begin at Market and Eleventh streets, Forty-seventh avenue and ocean house road and Surrey and Edna streets, all converging to a point south of the Park and near the ocean. The whole right of way covers more than 100 streets. The application of the San Francisco and West Shore Railroad was also passed to print. The right of way begins at the crossing of Twenty-fifth street and Potrero avenue and thence runs across Utah, Nebraska, Army, Vermont, Barneveld and Loomis avenues, and thence southwesterly over various streets to Worcester avenue, the terminus of the road. The third application passed to print was that of W. H. C. Fowler, Louis F. Durand, and John W. Eisenhush. The right of way asked for commences at Twenty-fifth street and Potrero avenue, thence on Twenty-fifth to Harrison, to Twenty-second, to Folsom, to Seventeenth, to Dolores, to Market, to Octavia, to Fulton, to Buchanan, to Eddy, to Steiner, to Greenwich, to Broderick, to Jefferson, to the eastern line of the Presidio; also beginning at Sanchez and Thirtieth streets, thence along Sanchez to Twenty-fourth, to Dolores, to Twentieth, to Church, to Nineteenth, to Sanchez, to Seventeenth and Dolores. The Market street Cable Company filed a petition for a franchise to extend its road from the intersection of Seventeenth and Castro streets, along Castro, Ridley and other streets toward the Presidio Reservation and the waters of the bay. An application was also received from the City Railroad Company to extend its line along Silver avenue, Mission and other streets to the county line.

Personal.

SUPT. THOS. H. LEGGETT, of the Standard Cons. Bodie, is in the city.

D. GRITMAN has resigned the management of the Clinton Co's mine, Amador Co., and W. E. Rogers is in charge.

SAMUEL JAMES, who has acted as superintendent of the Pioche Con. Mining Co.'s smelters, has gone to Salt Lake to live.

MAJOR WM. TOMS, formerly superintendent of the Ridgeway mine, New River, Trinity Co., is quite ill with pneumonia.

T. J. OSBORNE has been appointed as general agent for the Pioche Con. M. & R. Co., and took charge of matters last week.

F. A. FULMORE and J. B. Skewes, two well-known mining men of Bodie, have gone on a prospecting trip to Arizona and New Mexico.

C. T. RYLAND JR., the electrician, who has been superintending work on the Standard Co.'s electric plant at Bodie, has returned to the city.

ASSISTANT ENGINEER EMIL THEISS, who has recently been attached to the Bureau of Steam Engineering, Mare Island, reported for duty at the Union Iron Works during the past week.

MARTIN JONES, secretary of the Belmont and other mining companies operating in Amador county, was in Jackson last week, and visited the Astoria and other mines near Middle Bar, in which his company is interested.

J. H. TIBBITS, Superintendent of the Belmont mine at Sutter Creek, Amador county, has been appointed manager of the Albany mine, which is situated near the Hardenburg, on the Mokelumne river, and this week put several men to work getting the property in shape for extensive operations.

JAMES FINDLEY, the prominent mining man, is at Harshaw, A. T., engaged in superintending the shipment of the Huntington mill to the owners of the Antelope mine at Tucson. The mill will be taken by freight wagons to Tucson. This is the same mill which has ground out so much wealth for the Hermosa.

CHRIS JOCHER is prosecuting work at Park City, Utah, on the old Wasatch mine alone. His partners got tired and quit, as the ore they were taking out did not pay large enough returns; but Chris's faith is of different texture, and he is still strong in his conviction that rich ore is to be found there. His lease has one more year to run, and in that time he expects to see his hopes realized.

MR. JOHN C. EAMES has severed his connection with the Pioche Con. M. & R. Co., and left for Colorado last week. Mr. Esmes has acted as general manager of the company since early last spring, and on a cessation of active work by the company leaves, but expects soon to return to Pioche, as he has great faith in the future of that section, especially when the railroad builds in.

The Mining Outlook in Washington.

SEATTLE, Wash., Nov. 15, 1892.

TO THE EDITOR:—Barring some desultory work in the lower mountain ranges, the mining season in the State of Washington is now closed. Prospecting for claims has been followed generally, and comparatively little actual development done. A number of new and excellent finds have been made, so the coming season of '93 will doubtless result in exploiting some of the many promising prospects to a successful issue, for Washington has, to a remarkable degree, most favorable natural facilities for economic development and mine-working.

The ore channels cut across the precipitous mountain ranges, and may be opened by tunnels, so tbat a judicious expenditure of a moderate amount of capital would place thom in a condition for immediate and cheap mining. Concentrating ores are the rule. The metal to be extracted is diffused in grains and patches through a compact quartz gangue, or in strata, veinlets or seams, more or less refractory.

The gold and silver (gold predominating) is found in an iron-copper pyrites or sulphide, accompanied in many instances with the compounds of arsenic, antimony, galena and zinc in the order named and in a quartz gangue. The gold values are found in the mispickle or "white iron" ore of the miners. Very many feeders, or stringers, have been located that are not worth the recording fee, and extravagant prices are asked for three or four inches of this rebellious mineral. Yet in all of the districts known to the writer there are more than the customary number of claims that give every surface indication of strength and regularity of the ledges. These ledges run in parallel systems, cutting across the country formation and strata, the ore being in chutes or channels varying from 50 to 200 feet in length and from 1 to 20 feet wide, with a clay aelvage or gouge, in some cases on both walls. There is every promise that the ore will hold in depth and will be mined profitably for years to come.

Nature generally equalizes matter—a beautiful man must needs rely on his loveliness, or shape, to carry him through; for, as a rule, his mental holdings are not specially dazzling. Very rich and free ores are found in small seams, pockets or chambers, and very few "go down" to the 500-foot level. On the contrary, the refractory or low-grade ores are usually found in immense chambers or chutes, with a continuity and depth assured. As an illustration, in 1870 the writer mined in Gilpin Co., Colorado. The Bobtail and Gregory mines were then payers, and had been for yeara.

They declare dividenda to-day, and the character of the ore is very like tbat of Monte Cristo and Silver Creek districts of Washington. The immense money expenditures preliminary to opening the Monte Cristo prospects has advertised that district widely. The natural ore exposures are commensurate with the expenditures. No practical mining engineer would fail to be impressed with the parallel system of huge veins, and the prodigious amount of ore in aight, atripped by nature, and practically ready to break down. Besides the several bonanza groups that are capitalized in aix and eight figurea, controlled by the Colby, Hoyt and Wilmans ayndicate, favorable mention may be made of the Packard-Lockery group of twelve claims led by the Rantoul with two to ten feet of ore in place. Also the Peabody group of seven claims, with the favorably situated and promising Hannah in ore. These groups are held by the original locators and are excellent propertiea. In the Silver Creek district no development of moment was done the past season, the confident ownera biding their time until cheaper tranaportation rates, via. the Great Northern R. R. would permit them to work at a reduced cost. The hopes having been realized, they ahould the coming season read their title clear to demonstrated mines of value. This diatrict ahowa the blighted result of misapplied capital, worae than any other locality known to the writer in Washington, and that ia saying much. It ia the aame old, old story familiar to all old-timera, unsuccessful busineasmen, broken-down aporta and amall-calibered relatives of the promotera, with a sprinkling of alfalfa minera, pensioned off. These people are literally blowing good money into valueless holes, with the insane idea there are no barren zones. They drive at the most convenient place and auppose that pay rock ia certain if they are on a mineral vein. The good people of Washington are uot educated up to the fact that it requires a special and practical experience of years to acquire that most important preliminary atep, the proper place and way to open a mine, and that one must be governed almost entirely by each individual propoaition.

Tronblesome creek to East creek, Elk creek, Sultan baain and Index mountain country weaterly from Silver creek have excellent ore ahowinga in clearly-defined ledges, and have a bright future. In the Stilaguamish district work ia progressing in two camps that report they are in a workable grade of ore, and expect it to continue all winter.

Near Mount Baker, Skagit county, new discoveries have been made that promiae well. In King county the district of Snoqualimi has a auperior grade of ores, and considerable development haa been done, but unfortunately the "rule of thumb" and not the "rule of reason" prevailed, so a really meritoriona district ia passed by for less valuable and distant fields. On the head of the Skagit river ia situated the Cascade district. This ia a aure winner for a coming camp, with the best grade of soft, free-smelting ores—a galenite with a good value in gold and silver; a premium fluxing ore. Ita future is beyond cavil. It ia really an assured dividend-paying camp. These diatricts are more directly tributary to Seattle. Other diatricts will be described in a future letter.

TAYLOR D. MACLEOD.

Unless the mining community gives aome voluntary aasiatance to the California World's Fair Commissioners in the matter of aending in apecimens, etc., the exhibit of this State at Chicago will fall far short of expectations, Colorado will lead next year in the matter of an exhibit, and thus advertise herself in a way to bring good returns. The Commissioners here could only spare $15,000 for the mining exhibit, and much of this will go for freight, attendance, etc. They have thus far failed in getting satisfactory response to their request for exhibits. The mining counties have done very little indeed, and small effort is being made by them. The agricultural counties will doubtless have a creditable showing, but the prospects now are that the mining show will be far from satisfactory. If in each of the counties a few men would take up the work, collections of specimens, etc., could readily be made; but some one man or some few men must undertake the thing and make a start.

The Miner's Influence on Civilization.

Senator Stewart's Speech Before the California Mining Convention.

During the session of the State Mining Convention in this city last week, Senator Stewart of Nevada, who had been invited to be present, addressed the delegates as follows:

Mr. Chairman and Gentlemen of the Convention:—It is with great pleasure that I respond to your call. I am always at home and in good humor among the miners.

It is nearly 43 years since I commenced mining in this State. A generation has passed. Great changes have occurred. In early times mining was not only respectable, but it was the principal busiaess of the Pacific coast. To be a miner then was a passport to the best society that existed here. An honest miner became an honored man. Since then great changes have occurred. Mining has been depreciated and disgraced in the home of its friends. San Francisco was created by mining and maintained by mining. [Applause.] It is now exceedingly dull. Some have said that the dry-rot had even set in for want of mining.

For 30 years it was a well-established law of this State that the streams as well as the hills were dedicated to mining. Of course some injury was done by mining. An unnecessary clamor was raised after pretty much of the damage had already been done, and mining for gold was practically stopped. Any reasonable proposition to renew it was resisted not only with force hut with venom. No compromise, no matter whether harm was done or not, was entertained. The rule of reasonable use was trampled upon. It was denied that a party might use his own property, provided he did not materially injure his neighbor, but it was declared that he should not use it at all. That extreme was indulged in with regard to gold mining in this State.

You have locked up in these mountains a bed of gold gravel extending from 150 to 200 miles north and south, cutting through the tops of the ridges extending down from the Sierra Nevadas. You have just commenced opening that great gravel bed. Millions of money have been expended in tunnels and excavations and in ditches and canals to utilize it. While these millions were being expended the State encouraged it and endorsed it and rejoiced at it. When the money had been expended, then it was demanded by San Francisco and Sacramento that this property should be confiscated, and homes of the people of the mountains were destroyed—ruthlessly destroyed. I am not in favor of destroying the valleys; I am not in favor of injuring the harbor, but I am in favor of reason; I am in favor of such concessions on the part of the valleys and of the cities that the miners, too, may live, and that the world may have the benefit of the vast treasures that are stored away in your mountains. [Applause.]

I am glad to see the people of this State waking up to this, their paramount interest, and that there is a spirit of compromise; and a way will soon be devised whereby the mines can be worked and the valleys protected. There is no doubt about it. [Applause.]

It is within the range of science, it is within the range of practical engineering, and now you will accomplish it. The passion has passed away and the people of San Francisco and the valleys realize that they have as much interest in the mountains as they have in their own homes.

I am sorry that the people of San Francisco have not realized it earlier, and I am also sorry that the people of California have not realized that there is another class of mining important to the State, while we see vast buildings in this city erected by silver mining. I regret that anybody should come from this State desirous of destroying silver mining. I regret that this State should be represented as hostile to silver mining, because upon silver mining, as well as gold mining, the prosperity of this coast depends. [Applause]

It was the miners of the Pacific States and Territories that laid the foundation for this western empire; it was the miners and pioneers of this country that made it possible to obtain a sufficient metallic basis to give credit to the Government and save the Union. [Applause]. This vast region between here and the plains of Missouri would still be uninhabited if it had not been for gold and silver mining and tbe hardy race of pioneers that developed those mines.

Now, few persons realize the importance of mining. They even compare it to other minor pursuits. Mining for the precious metals is the most important avocation in the world. Without it civilization must cease. You can get farming land anywhere. Not one-fourth of the farming land of this earth is cultivated as it should be. Vast regions are untouched, but mining for both gold and silver is confined to narrow limits, and there can he no successful agriculture without gold and silver, no successful business of any kind so long as metallic money is the basis that measures all credit and all property. So long as money is a necessity to man, mining is the most important of all occupations.

If you trace the history of the world you can write the rise and fall of nations by the production of the mines. Give me a history of the mines and I will tell you the state of civilization at the time. No nation has ever advanced in civilization without gold and silver mines. Why is that? It is because money is as essential to civilization as is language. By language we interchange thought: by money we interchange commodities, the fruits of labor, and without such interchange there can be no civilization. In isolation neither language nor money is necessary, but individuals cannot become civilized alone. It is by the division of labor. It takes money to perform the various functions of civilization; it takes money to interchange the commodities and the fruits and labors of each. Upon money everything depends.

When Egypt built the pyramids, Nubia yielded up her treasure of gold and silver. When Babylon and Persia, the Egyptians, the Israelites and the Phœnicians prospered they had their mines of gold and silver. We now find where they had their Ophir and their other mining fields. The ruins still remain. When Greece was the cradle of learning for the world and when she made such an advance in art, science and literature that it is the pride of this generation and all other generations that succeeded to to imitate her, Xenophon recorded where she got her gold and silver. It was from the mountains of Thrace. When Rome was mistress of the world she had thousands of soldiers tearing down the mountains of Italy and Spain, and the ruins remain.

Then mining ceased and then came 1400 years of gloom and despair. The people had no money. They submitted to slavery. The dark ages prevailed. The feudal system was inaugurated. The lands fell into the hands of the few. They were morigaged. The people became weak and poor and they were destroyed. Civilization was blotted out. No reform, no progress, no invention was made while they had no money.

The New World was discovered 350 or 400 years later, and then Mexico and South America commenced pouring their treasures into Europe. The race had not been destroyed, but it was impoverished, and when new life was breathed into that country hy more money a new civilization sprang up and it moved on. Modern civilization was created, and was dependent upon the money that was furnished from the Western continent. For 300 years, from 1500 to the commencement of this century, the stream of gold and silver from the New World to the Old World was uninterrupted. Progress went on.

When the Spanish-American wars broke out and cut off the supply by stopping mining, a money famine ensued, and from 1800 to 1850 the people realized what the world is now realizing—falling prices and hard times. I remember that struggle. I was then a boy in the midst of it. I remember the wages of labor and the difficulty of paying taxes. Eight dollars a month for a strong workman on the farm was ample compensation, and it was sought for by the most enterprising. Hard times prevailed. Every invention was resorted to. Every theory of finance was discussed—high tariffs and low tariffs, every economical device, and the people were taught this and that. This went on until 1850 without relief.

Then came the glorious discovery nf gold on the Americao river. [Applause.] Following that came the discoveries in Australia, and the world was then set in motion, and the venerable historian, Sir Archibald Alison, who had been engaged for 50 years discussing various economics, declared that we were all mistaken, that it was the want of money that made hard times. In proving his assertion, he said that we find to-day (tbis was writing in 1853) that the free-trade States and the tariff States are alike prosperous. The world is moving on. There never was such a hoon extended to man as the California discovery. After that discovery, civilization advanced more in 25 years than it had in any century. [Applause.]

Talk about farming lands. Why, the little narrow space that you mined developed more farming land throughout the world than had been developed in centuries. It gave new life to everything. [Applause.] They penetrated the wilds of the West. Population spread like a prairie fire over the vast plains of Missouri. People had money with which to do something. They penetrated every clime, because they had money to purchase their ambition. It came from California and Australia. You went on furnishing the sinews of war so far as gold was concerned. They made you stop because you were destroying a few acres of farming land. Through your efforts you extended farming over millions of acres of uncultivable land and made it possihle for the emigrants of the Old World to make homes throughout the vast West and make an empire here.

During this time you penetrated the mountains and found silver mines. The Comstock was discovered and otherwise followed, and all the world rejoiced. I remember very well when I was first elected to the Senate. During the war, calling on Lincoln, he took me by both hands and said to me: "I am glad to see you. I am pleased to meet a representative of the Pacific States and Territories that enabled us to prnsecute the war, for without your gold and silver we would have been helpless. [Applause.] When gold-mining declined, we were particularly encouraged at the discovery of silver mines, because silver is always the money of the people."

We were held as benefactors. We had discovered these mines. We had invested our all in them—predicated upon what? Upon tbe use of silver from prehistoric times; upon the fact that 1,200,000,000 of people use silver and only 50,000,000 use gold—predicated upon the fact that silver was used as money before gold; predicated upon the fact that gold and silver were hoth money of the Constitution. We made the investments on these assurances. Your fellow miners spent their lives, their fortunes, and all they had was in silver mines. In an evil hour silver was rejected as money for the purpose of producing contraction and destroying one-half of the world's money. The first step in demonetization was taken by the United States by the passage of an Act to codify the mint laws, which omitted the silver dollar from the list of coins. The sixteenth section of the bill which omitted the silver dollar was never read in the Senate. It was smuggled through. I have charged it in high places, and will continue to

charge it and prove it from the record. Germany followed the action of the United States, and then the Latin Union also demonetized silver, aud silver was excluded from the mints the same as your gold mines were excluded from the rivers.

Silver bullion fell in price because the market therefor was cut off, and then the bankers and money loaners of the world discarded silver coin as reserves. There were at the time $7,500,000,000 of gold and silver coin in the world which was the basis of circulation and credit. Upon that sum rested the aggregate indebtedness of not less than one hundred thousand millions, which was payable in either gold or silver coin at the option of the debtor. As soon as silver bullion fell (for the reason of want of market and for no other reason, because there was no overproduction of it) they commenced discarding silver as reserves until silver is not considered a good reserve in Europe or America, except in France, which country has two hundred and sixty millions of silver which she pays out on demand. Our silver is reserve, but the administration will not use it as money.

By the demonetization of silver one-half of the reserves in which every debt has to be redeemed has been destroyed, and to-day instead of having $7,500,000,000, we have only $3,750,000,000 of metalic money upon which rests the credit and business of the world.

What has been the result? A fall in prices of 40 per cent. to correspond with the diminished basis. Farm lands in Europe and America, where there is no local cause to counteract it, such as emigration and building of cities, have fallen in fifteen years fully 50 per cent, and still they are going down. Money is growing so valuable that it cannot be used in enterprises. Your city is stagnant. Behold! It is a fair example of what the whole world is.

You will say that you have plenty of money in banks. There is where it goes when it is too dear to use in business. Falling prices discourage enterprise. A man who goes into debt sells money short. No prudent man will go into enterprises now, because while he is working his plant, property will fall and he will be ruined. There is too much money to invest in gilt-edged securities, but there is not enough money to move the country. Business is stagnant, millions of people are out of employment; everybody is hesitating and the gold ring is curtailing credit to increase their reserves. The business of every great financial institution in the world to-day is to curtail credit and increase reserves to save itself from bankruptcy. This is the situationi What we want is more silver. [Applause.] If all that had been produced of both during the last eighteen years had been untilized there would have been enough. In 1852 the output of gold and silver was over $200,000,000. $196,000,000 of gold alone. That was a sudden increase from 1848, when the aggregate was less than $40,000,000. It is said that that increase created great inflation. Did it do any harm? On the contrary, did it not bring forth the energies of all mankind?

From that time to 1873 the product continued to be about $200,000,000 a year. The year that silver was demonetized there was $81,000,000 of silver produced and $96,000,000 of gold. There was no excess then, nor has there been since. There has not been an increase of silver, and now the joint product of the two metals reaches $250,000,000.

Do not rely on statistics for information, for they are fixed for political purposes. They have no means of collecting statistics in Mexico and South America and in this country. If it were not for Wells, Fargo & Co., they would not get within a mile of it. There is no accumulation of silver bullion anywhere in the whole world, but the price is fixed by speculators with a view of degrading it and excluding it from the mints and making the gold which they own exceedingly valuable.

The money question is paramount to all other questions. Give the people plenty of money and they will take care of themselves. They will erect good schools and educate their children. They will take hold of the storehouse of nature and bring forth the hidden forces that exist in the elements. They will enslave the elements, not men. They will liberate the people and give them money to maintain civilization and business. They will make the lightning subservient to the use of man. They will make light, heat, water and all the other elements do the labor of man, if you will not cramp them. But when you reduce your independent farmers to tenant farmers, when you destroy the producing classes you stop civilization. The money kings will invent nothing but ways and means to rob the masses.

It is the producing classes, it is the miner, the mechanic and the scientist that unlock the storehouse of nature and let us progress. Why will man take from the miner and the mechanic the key whereby he can unlock these vast resources? Why stop mining? Why make war on the producing classes?

Let San Francisco take warning. If she continues to adhere to the gold standard and continues to make the gold standard smaller by closing up the mines, stagnation will follow and bankruptcy will be inevitable. [Applause.]

With your glorious State and glorious climate, with the vast resources that you possess, all the intelligence and energy of the people of the Pacific coast, you will make California the greatest State in the Union. If you are true to yourself and your manhood there is no such thing as fail. You will take the gold from those mountains, you will join us and restore silver to to the place it occupied as money under the Constitution before the crime of 1873 was committed. [Applause.] If the Pacific coast States and Territories will unite in one grand effort they can lift the cloud that hangs over the energies of the civilized world and give them new life. It will be like the great discoveries that happened in California and Australia, that made the heart of man glad and did more for civilization than any other event that has transpired in all the centuries.

Let us unlock the mountains and enjoy the heritage given us. Let us open our silver mines and restore that metal to its rightful place. Let the people have more money and you will have more prosperity and more wealth.

At the conclusion of the Senator's speech three rousing cheers were given in his honor.

Meadow Lake Mines.

The Work That Is Now Being Done In That District.

J. B. Gray writes to the Nevada *Transcript* the following letter concerning the Meadow Lake district:

Notwithstanding the signal failure that in almost every instance has attended the attempted development of the famous Meadow Lake mines, there are yet a few miners and prospectors who still have faith in the district and believe the quartz found there can be profitably worked. Considerable prospecting has been done there the past two or three summers by John Clark, Frank Cook and F. E. Shute, all of Sierra City. Messrs. Cook and Clark have put up this season a small prospecting mill with which to make a practical working test of the ore. The mill will contain four stamps and a Frue concentrator, and was, at the time this writer visited their works three weeks ago, about ready for operation. Power is supplied by means of a water wheel. The plant, though small, will be adequate for the purpose, and is put up in a very substantial manner, all of the carpenter work and much of the other work having been performed by the owners. The mill is situated on what has been called the Hercules mine, which is one of the locations held by Clark and Cook. They have two locations, the ledges varying in width from 5 to 50 feet and the ore averaging $10 per ton. On one of the ledges a shaft has been sunk to a depth of 113 feet. Considerable rock has been taken out in different places and several hundred tons are already available for crushing.

It is the intention of Messrs. Clark and Cook to crush the ore and pass the pulp over the Frue concentrator without using quicksilver in the battery or on the plates. Experience has demonstrated that most of the gold contained in the quartz is of a peculiar nature and refuses to amalgamate when quicksilver is used. There seems to be a fine coating or film upon the gold, which will not allow it to unite with the quicksilver, and consequently when this sort of amalgamation is tried the gold becomes scattered and the greater portion is lost. It is expected that the concentrator will not only save the sulphurets but will also catch most of the free gold that is found mingled with it, as is the case when tests are made by pounding the rock in a hand mortar and "horning" it out. Splendid prospects are obtained in this way. The concentrates saved at the Clark & Cook mill will be worked by H. H. Hartley, the veteran prospector and millman, who has been a resident of Meadow Lake nearly 30 years and who claims to have a practical process for working the concentrates at a profit. What his process is nobody knows. It is a secret with himself and he will not even have it patented. By crushing the rock in the manner described and the concentrates treated by Mr. Hartley's process, they expect to make their mine pay; at any rate they will find out whether it is a paying proposition. If so, the capacity of the mill will be increased next year. On the other hand, should it prove a failure, they probably will try the cyanide process. They are determined to give the ore a thorough test by all the latest and most improved methods. We trust their efforts will be crowned with success, which means a fortune not only to themselves but to all others interested in the district, and a revival upon a more certain basis of some of the old-time activity in that section.

H. H. Hartley, the pioneer of that part of Nevada county, is the principal mine owner in the district, many of his locations being covered by patents. He is owner of the Excelsior mine, the largest and richest ledge in the camp, running from 10 to 50 feet in width, the ore paying by mill process from $8 to $20 a ton. It has been prospected by numerous cuts, shafts and tunnels. The Excelsior mill and reduction works, in the construction of which over $100,000 was expended first and last, belongs to Mr. Hartley, and it is here that he works, single handed and alone, crushing and reducing ore from his mine. Of course he cannot accomplish much working this way, but he claims that he makes it pay and is contented with the world.

"Old Man" Hartley, as he is familiarly called, has passed nigh on to 30 winters within the snowy fastness of that wild and rugged country.

F. E. Shute is doing some prospecting in the district for Sierra City parties, and has made two or three locations that promise well.

George Clark, brother of John, is living at Meadow Lake and is engaged in prospecting.

O. S. Holbrook, another old-timer in the camp, is still there. He has several ledges located and goes up every summer to look after them—the boys say to see that no body takes the claims off.

In examining the various mines, ledges and prospect holes that abound in Meadow Lake district, we were shown the famous Pacific mine, now called the Diamond. The mine was discovered and located in 1865 by John Kistle of this city. Eighteen tons of the ore taken from this ledge were hauled from Nevada City that year by ox teams, and crushed by the old Charonnat mill at Canada Hill. The first five tons yielded $56 per ton, the remaining 13 tons paying $47 a ton. In those days no sulphurets were saved. It cost $30 a ton to have the quartz hauled here. Kistle and his partners afterwards sold the mine to James Blood of Plumas county, who expended a large sum of money in endeavoring to develop the property, but without success. A large three-compartment shaft was sunk about 100 feet, the rock being hoisted by means of a large windlass operated by hand power. After getting down on the ledge, the quartz could not be made to pay, nor did it prospect anything like it did near the surface where Kistle & Co. took out their rock. It was decided by experts that the gold could not be extracted, owing to the ore becoming more and more refractory as a greater depth was reached. A mill that had been erected failed to save the gold, and a heater was put in to heat the water used in the batteries, hoping thereby to facilitate amalgamation. This experiment necessitated the outlay of considerable money, and nothing availed. Blood, like hundreds of others, finally abandoned the mine, and no work of any note has been done on it from that day to this. There are probably 300 tons of ore piled up near the mouth of the shaft.

Opinions differ as to the worth or worthlessness of the mines of Meadow Lake district. Experienced metallurgists cannot agree regarding it, while old miners and prospectors have numerous pet theories. Some hold that there is no gold in the quartz to speak of after a certain depth is reached. Others claim that the gold is there but is so mixed with base metal that it cannot be profitably worked by any of the ordinary methods employed in the treatment of refractory ores. Dozens of processes have been tried, but so far no means have yet been discovered by which the ore has been worked to any extent at a profit. Samples of the quartz have been sent all over the world to different reduction works, even to the far-famed smelting works at Swansea, in South Wales. Satisfactory returns were received from this latter place, we believe, but the cost of shipment was too great to make it a paying venture.

It may be that Clark & Cook have struck the right system and that, with the aid of Hartley's process in working the concentrates, they may make the ore pay. Or it may be that the new cyanide process will solve the problem. In either event we hope that their efforts will prove successful. There is plenty of rock in sight in Meadow Lake to keep 20 big mills running, and once a profitable way of working it is found it would not be long before the mills would be in operation.

Working the W. Y. O. D. Mine.

GRASS VALLEY, Nov. 7, 1892.

TO THE EDITOR:—In your issue of Nov. 5th your correspondent stated that a year ago the W. Y. O. D. mine was a prospect, and that capital and intelligent enterprise took hold of it and made it one of the big mines. The fact is, this has not been a prospect for more than two years. Over one year ago there were four dividends of five cents per share. In the present year there have been six dividends of ten cents per share. On the 15th day of August, 1892, there was in the treasury $15 000, which would amount to five monthly dividends of ten cents per share were it paid that way. There is also as good a plant above and below ground as on any mine in the State, and all paid for. Allow me to report that the intelligence which started this mine in 1886, from the grass roots down to the depth of 940 feet, did all the management of the mine up to the 15th of August, 1892, and they intend to hold their record against any who try to claim it.

If those who own and manage it now can show the same energy and use the same judgment the starters did, this ought to be one of the biggest of mines for an unknown time. Yours respectfully, THREE OF THE ORIGINALS.

Mr. Aaron's Articles Appreciated.

FORBESTOWN, BUTTE CO., CAL., Nov. 9, 1892.

TO THE EDITOR:—Having seen one or two comments upon Mr. Aaron's articles in the PRESS which show anything but a proper appreciation of them, I take the liberty of saying that I, for one (and doubtless there are many more), feel that all the PRESS readers are actually benefited by his contributions.

The total lack of dogmatism, coupled with genuine worth of the information imparted, is almost characteristic of Mr. Aaron's papers. His articles upon the cyanide process are, to my mind, unexcelled for lucidity, and invariably make me wish for more, especially of the chemistry of the process. Sincerely, M. H. B.

THERE are 300 men at work on the great Pine Ridge flume, Fresno Co., or on the mills which supply lumber to the flumemakers. The dam across Stephenson creek, about a mile below Bennett's mill, is built in a narrow gorge of the creek, between two points of hills. It is faced with large blocks of granite, in the manner of two walls across the channel, and between them loose rocks are piled. The upper side of the dam will be faced with lumber. When the dam shall be completed, it will cause the water to collect above in a reservoir that will cover about 1200 acres, at an average depth of 30 feet. Work is being pushed forward under the superintendency of Mr. Shaver. The flume is double, the V flume that will carry the lumber being above the large flume which will transport the water. The large flume for the water will be dropped when the head of Dry creek is reached. The water will flow down the channel of the creek from that point. But the V flume for the lumber will be continued to Fresno, and will be finished next season. The mills on Pine Ridge, that usually close before this time of year are still busily at work cutting lumber for the flume. The Bonanza mill, owned and operated by C. D. Davis, cuts from 40,000 to 50,000 feet a day. The Bennett mill, a mile beyond, is also running at its full capacity. All is in operation and everybody is busy.

W. S. KEYES, mining engineer, vice-president of the California State Mining Bureau, left on the steamer of the 18th to investigate a system of mines near Rosario, in the State of Sinaloa, Mexico. Mr. Keyes' address until February next will be care of agent Pacific Mail S. S. Co., Mazatlan, Mexico.

EXTENSIVE prospecting has been going on in the foot hills of the Siskiyous, and some very promising finds have been made on the California side of the divide, says the Yreka *Journal*. There can be little question that the hills are full of mineral in every direction awaiting discovery.

A PROPOSITION is to be considered as to adding a labor employment bureau feature to the State Miners' Association, so as to provide superintendents with competent men and give the working miners a place where they may look for work.

Mechanical Progress.

The Brown Segmental Wire-Gun.

Mr. N. B. Wittman, at a recent meeting of the American Institute of Mining Engineers, read a paper, of which the following is an abstract:

The system consists essentially of the subdivision of the inner core or tube of the gun, which takes up the initial compression into longitudinal segments of such size that a higher physical condition and degree of special elasticity may be set up therein than it is possible to produce in the larger masses of metal heretofore used for the tube of the modern high-power cannon. The process consists in winding layers of square steel-wire, subjected to a constant tension of 130,000 lbs. per square inch, around these segments, which, when so held together, form the tube of the gun. A lining-tube may or may not be used.

The steel segments used in the gun now under construction are 18 feet 4 inches long and 3 inches thick at the breech, from which they taper to 0.8 inch at the muzzle. The physical condition of the segments has been determined hy a test piece, cut from each end of each segment, which showed the following characteristics: Tensile strength, 165,000 lbs. per square inch; elastic limit, 105,000 lbs. per square inch; elongation at rupture, 14 per cent in two inches. They are of crucible chrome-steel, made by the Carpenter Steel Works of Reading, Penn. The wire which holds them together has 0.005 square inch sectional area and is wound under a constant tension of 650 lhs. on each strand, equivalent to 135,000 lbs. per square inch. The winding has been done by a machine designed for the purpose by Mr. J. A. Brown, the inventor. It consists essentially of a windlass and series of rollers, which act as a clutch, hy which a weight is attached to the wire, and which is fitted with a friction-brake, automatically regulating the speed of the passage of the wire through the machine. This speed being kept the same as that of the winding, the weight is thus held at a fixed height, insuring a constant and absolutely uniform tension upon the wire.

The wire used has the following physical qualities: Tensile strength, 250,000 lbs. per square inch; elastic limit, 200,000 lbs. per square inch; torsional strength, 30 full turns in eight inches before breaking. Following the curve of maximum pressure, the segments are wound at the breech with 33 layers of wire, making a total thickness at that place of 2.31 inches of wire, and a layer is dropped at each ten inches, so that there are but ten layers at the muzzle, giving at that point a thickness of 0.71 inch. Altogether, 3256 lbs. of wire were used, equivalent to a single strand extending in a straight line for 37 miles.

The wire was anchored at each end by a special device invented by Mr. Brown. As no flow of metal will occur below the elastic limit of the steel of which the segments are made, enlargement of the bore will not take place below a pressure of 94,000 lbs. per square inch, this being 94 per cent of the elastic limit, if that limit be taken at 100,000 lbs. per square inch (the minimum obtained from any one of the test-pieces). As the pressure between the segments at the surface of the bore, induced hy winding, is 100,000 lbs. per square inch, it will require a powder pressure of 63,200 lbs. per square inch to reduce this compressisn to zero. In order to demonstrate practically the truth of this proposition, a stub representing the powder-chamber of the gun was made and encased in a steel-jacket, into the ends of which heavy plugs were screwed, entirely closing the powder-chamber, with the exception of an aperture 0.2 inch in diameter, to serve as a gas-vent and firing orifice. This has been fired repeatedly, with a charge which generated in all cases over 50,000, often over 60,000, and on four occasions over 66,000 lbs. per square inch, and in every instance without the slightest indication of displacement of the segments or enlargement of the bore.

The trunnions are attached to a trunnion-jacket, which is screwed to the breech of the gun. The major portion of the longitudinal thrust produced by firing is taken up by this jacket, and not oy the inner tube. This is one of the special features of this system of construction. The chase of the gun—that is, that part in advance of the trunnions—is protected from the effect of small-arm and machine-gun fire by a steel-jacket shrunk upon it. The breech-hlock presents some novel features in the way of simplicity of design and the maintenance of efficiency, in view of probable rough usage in actual service. A continuous thread is used, and when the block is thrown open for charging, a latch locks it, so that it cannot be turned until it enters the breech. This insures proper centering of the threads under all circumstances, and a consequent minimum of wear. The service-charge of a gun of this size, made in the usual way by shrinking steel hoops over a central tube, is llmited to a powder-pressure of 37,000 lbs. per square inch, while in the Brown gun the ordinary charge will generate 50,000 lbs. pressure, and 60,000 lbs. per square inch can be reached with entire safety.

How Wire Glass is Manufactured.

Last week reference was made in the *American Manufacturer* to the factory at Tacony, near Philadelphia, for the manufacture of wire glass. It appears that the process and machinery employed were invented by Mr. Frank Shuman of Philadelphia. A glass rolling-table has a three-roller carriage moving over it running on the side ledges. The glass is rolled out upon this table, the ledges regulating its thickness. Two of the rollers are smooth; the central roller has a series of grooves running around it. Between the leading roller and the corrugated roller a slide is placed for the reception of a sheet of wire gauze. A proper quantity of melted glass is poured out upon the table, the hot sheet of wire gauze is placed in its carrier, and the roller carriage is started. As the carriage progresses a little, the wire is dropped. The first roller has rolled out the glass. The wire gauze strikes the partly fluid glass, and is drawn under the corrugated roller. This seizes it, and by its corrugations, forces it into the pasty glass to the required depth. The compound mass then goes under the third roller, where it is rolled smooth, and the operation is completed. The sheet is now annealed in the usual way, and is ready for use.

By modifications in the apparatus, various products may be obtained. The wire gauze may be heated so hot as to receive a corrugated contour, which it retains in the glass. It may, on the other hand, be worked at so low a temperature as to lle quite flat in the finished product. The corrugated roller may be adjusted to give it any desired depth in the glass. I: is stated that sheets of wire glass six feet long, two feet wide and three-eighths of an inch thick have been rolled at the experimental plant in 35 seconds.

It is now announced that the doors, windows and ports of the new cruiser New York, at Cramp's shipyard, shall be fitted with wire glass, a newly-devised material for the manufacture of which large works are being erected at Tacony. It is held that as a result of the wire netting in the glass, the shock and jars resulting from the discharge of guns or collisions do not shatter the pane, but leave it intact.

Compound Engines.

The idea has been advanced that the compound engine, to be efficient, need not be in one machine, nor necessarily attached to the same work. When a sufficiently high pressure is available and suitable conditions as to work exist, two entirely separate engines, whose sizes bear the proper relations to each other, may, according to *Power*, be run together upon the compound principle. It costs but little more to make a pound of steam at 120 pounds pressure than at 60, and obviously the higher pressure steam is capable of doing more work.

Suppose an engine has been running at 60 pounds pressure, which pressure is best adapted to the range of expansion in that cylinder under the conditions of its work. Suppose now it is found possible to carry a pressure of 120 pounds. Another engine can be run from the hoiler at this higher pressure and exhaust at a pressure of 60 pounds into a receiver, which can take the place of the boiler that supplied that pressure to the original engine. The problem is to so proportion the cylinders that the low-pressure cylinder shall take as much steam out of the receiver as the high-pressure cylinder delivers to it in a given time.

Where both engines are connected to the same load this is easily done, for, supposing the load to be lessened, the first cylinder will take less steam from the boiler and deliver less to the receiver. If the point of cut-off on the low-pressure cylinder is fixed so that it takes the same volume of steam from the receiver as before, the pressure in the receiver, and hence the initial and mean effective pressure in the low-pressure cylinder, will fall, or if the cut-off in the low-pressure cylinder is controlled by the governor it will take less steam, preserving a uniform receiver pressure, in either case reducing the work done in accordance with the demand of the lesser load.—Manufacturers' Gazette.

Scientific Progress.

New Chemical Processes.

Mr. Ludwig Mond has published particulars of a method nf utilizing the chlorine which has hitherto wasted in the ammonia process of manufacturing caustic soda. The process is extremely ingenious. The preliminary treatment of the brine with ammonia and carbonic acid leaves the manufacturer with bicarbonate of soda, which crystallizes out, and with a solution of ammonium chloride, or sal ammoniac, as it is commonly called. Hitherto the ammonium-chloride solution has been boiled with lime, in order to recover the ammonia, the resulting products being gaseous ammonia and chloride of calcium. Up till now, the latter has been allowed tn run off, carrying with it, of course, the chlorine derived from the brine (chloride nf sodium). The new system begins when bicarbonate of soda and ammonium chloride have been formed. The first having crystallized and been removed, the second is frozen by means of liquefied ammonia until it also crystallizes. It is next dried and sublimed, the vapor being passed over magnesium oxide, which parts with its oxygen to form water with some of the hydrogen of the ammonium chloride, seizes the chlorine, thus becoming magnesium chloride, and allows free ammonia to pass on. Up to this point, therefore, the operator has recovered his ammonia as before, but is left with magnesium chloride instead of calcium chloride. The next step is to pass hot air over the magnesium chloride, the result being that that compound is again converted into magnesium oxide, while the chlorine is set free, and is turned into bleaching powder in the usual way, but at what cost we are not at present informed.

The discovery of a new and simple process of producing caustic soda, chlorine, and other chemical products direct from the brine by electricity is also announced. The problem is one which has long occupied the close attention of chemists and scientists. The chemical fact that caustic soda and chlorine can be produced from a solution of common salt by means of electricity has long been known, but hitherto the process has been too costly to enable it to be worked on a commercial scale. The great difficulty has always been found in regard tn the expensive anodes required for the decomposition of the brine, and which in turn were themselves rapidly disintegrated by the absorption of the nascent chlorine given off during the process. Another difficulty was to prevent the recombination of the products when once they had been separated. Mr. James Greenwood, the eminent electrochemist, has patented an important new departure by which both these difficulties are claimed to have been overcome. He has invented a compound anode of even greater conductivity than those hitherto employed, but treated in such a manner as to render it nonporous and unattackable by the chlorine, and therefore much longer lived, while he has also devised a patent diaphragm which renders the recombination of the products impossible. The process has been worked on a commercial scale with success for some time in London, where an experimental plant was laid down. A still larger installation is at present under construction near the metropolis, where the working of the process will be subjected to the most rigid tests for a considerable period. Should these prove satisfactory, arrangements have already been completed for the erection of a very large plant for the manufacture of caustic soda and chlorine, or bleaching powder, by the new method in Germany. The process has been favorably reported upon by many eminent electricians and electrochemists, including Dr. G. Gore, F. R. S.; Mr. W. H. Preece, F. R. S. (electrician to the General Post Office); and Messrs Cross & Bevan, consulting chemists, London.

DECORATIVE GLASS.—The use of decorative glass in modern buildings is becoming more and more widespread everyday. Stained glass is used not only in transoms and dome lights, but the ordinary clear glass used in windows, doors and partitions is either embossed by an acid process or etched by a sand blast, creating a new world of decorations. There is the ordinary ground glass on which one can write with a pencil, but this method of decoration has been superseded hy the silver embossed process, which renders the glass at once obscure and translucent, and which will not receive pencil marks or finger stains. The decoration consists of scroll, diamond, square and oircular repeats, decorated borders, monograms and numbering and lettering of all kinds for commercial purposes. A panel of chipped glass that seems to be sliced from the irregular face of a crystal rock is a brilliant accompaniment to its decorative surroundings.

Spectrum Analysis of Planetary Atmospheres.

Mr. Jansen, the well-known astronomer, is, according to *La Lumiere Electrique*, at the present moment engaged in some highly interesting researches on the constitution of the atmosphere of Venus, and in these researches the application of the electric light plays a most important part. The recent discoveries made with regard to the planets Mars and Jupiter, have invested the subject of the constitution and nature of other planets with fresh interest; and it is clear that if the presence of water vapor could be proved in the atmosphere of Venus, we should be justified in concluding that seas and rivers exist in that planet, and that the organization of that brilliant heavenly sister of the earth is similar to that of our own planet.

The basis of these protracted and difficult researches Is the well-known property of electric light of presenting brilliant rays only, and not a single dark ray. Starting from this assumption, Mr. Jansen passed a powerful ray of electric light through a tube containing a considerable quantity of water vapor, heated to a temperature of 300° C. By using a tube of 170 feet length, he succeeded in accurately determining the rays of water vapor. In possession of these valuable results, he profited by the two oppositions of Venus which took place a few months ago, in order to study the light of that planet. The aim he had in view was to determine whether in its characteristic rays those rays could be found which indicate in an unmistakable manner the presence of water in the state of vapnr. The exceptionally favorable position in which the planet then was enabled Mr. Jansen to carry out his investigations with a rare chance of success, but for all this he could not arrive, in Paris, at entirely conclusive results. The reasnn for this is not very far to seek. Although the star was at a considerable height above the horizon, its light traversed a part of the atmosphere charged with water vapor, and consequentlyshowed in the spectroscope the characteristic rays of that substance. It was therefore difficult to dlstinguish in the total effect, as shown by the spectroscope, what portion of it belonged to the planet and how much to our earth.

Now, matters are different on the top of Mont Blanc, where all the watery vapor contained in the upper layers of the earth's atmosphere is reduced to the form of snow, a form in which it does not effect in the least the nature of the light rays. This is the reasnn why the learned astronomer attaches so much importance to the erectlon of a large observatory on the top of a mountain, which, for a long time, had been considered inaccessible. The work of construction is being actively pushed on, under the superintendence of Mr. Jansen himself, and the observatory, when completed, will doubtless enable him to bring to a successful issue the researches which he commenced at the Meudon observatory and which, as already stated, are based upon a characteristic property which electric light possesses in common with sun light. It is known, in fact, that none of the innumerable rays we perceive in its spectrum belong to it; they are all produced by metals held in suspension in the photosphere. In a similar manner the dark rays of electric light are entirely due to metallic substances contained in the electrodes, and have really nothing to do with the light itself. However this may be, it is, thanks to the employment of the electric light, that we have arrived at the conclusion that the various hodies of the solar system are of identical composition. This important conclusion naturally leads to the idea that the different planets, at least those which, like Mars and Venus, show so much similarity with ours, are covered with plants and animals differing from those with which we are familiar no more than plants and animals of the torrid zone differ from the glacial zone. As soon as Mr. Jansen has finished the researches in which he is at present engaged, we shall give an account of the ingenious apparatus devised by him for making an exhaustive study of the spectrum of watery vapors. It is not sufficient, as we have seen already, to trace more or less slight indications, showing the presence of substances to be found in our own atmosphere. The proof is not complete unless we can perform a sort of quantitative analysis, so as to determine not only the presence but also the quantity of the substances contained in the planetary atmospheres. Then, and then only, will the man of science have a safe guide in regions where hitherto poets and dreamers have held undisputed sway.

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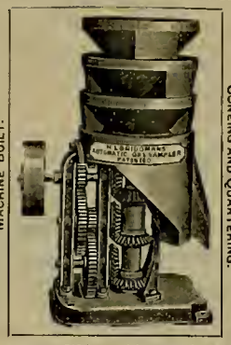

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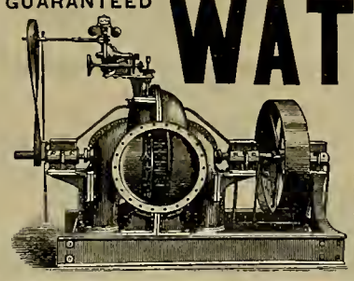

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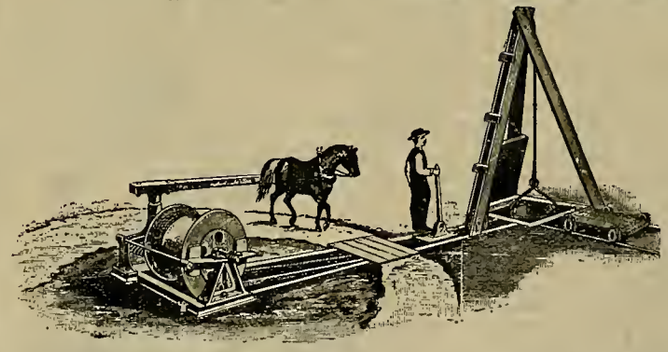

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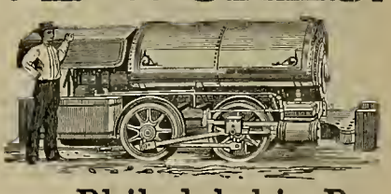

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Electricity.

A Perfect Overhead Electric Construction.

At the recent convention of the American Street Railway Association, at Cleveland, Ohio, a report on "A Perfect Overhead Electric Construction" was read as follows by Charles H. Smith:

Iron or steel poles have proved to be the most desirable. I would therefore recommend the following: The poles to be of tubular iron, 32 feet in length, and made in three sections, in the usual way. The lower section should be at least seven inches in diameter, and the other two sections six inches and five inches respectively. The poles should be set in concrete and at least six feet in the ground, and should not be more than 125 feet apart. The top of the pole should have about two per cent of rake away from the curb, and should be fitted with a suitable pole clamp, so that the span wire can be easily adjusted to the required height, which should be 22 feet above the track. On top of the pole should be a malleable iron cross-arm to carry the feeder-wires and guard-wire spans. This cross-arm should be insulated from the pole by means of a wooden plug inserted in the top of the pole. The insertion of the joints of the pole should be at least 18 inches, and the joints should be made solid throughout their entire length by means of shims or other contrivances.

If these joints are not properly made, the poles will not stand the strain. For curves, or extra strain, there should be larger poles of the same make.

Span wires should be of No. 4 B. W. G. silicon bronze wire, and should be fastened to pole clamps by means of insulated turn buckles. Great care should be taken in insulating these turn buckles from the poles.

All well-built lines should be sectional, and the trolley-wire should not be of too great a size, as it would then call for clumsy supports. As it is not the main-current wire, it can be of a smaller size. I would therefore recommend No. 4 B. W. G. silicon bronze wire, which affords sufficient carrying capacity, and has great strength and durability.

Sections should not be of a greater length than two miles, and should be separated by trolley-breakers, of which there are now a number of good ones in the market. In cities and villages, where there is a great liability of fires, it would be advisable to put trolley-breakers at shorter intervals. Trolley-wire hangers and pull-off brackets should be of the lightest make possible, and still have the required strength and the very best insulation. There is a variety of such hangers and brackets now in the market.

As it is important to have as small a number of joints as possible in the trolley-wire, it should be put up in mile lengths, and twisted splice joints should be made, and brass cone-shaped tubes slipped over the wire before the splice is made. After completing the splice, the larger ends of the tubes should be brought together over the splice and a little solder dropped through a small hole made in the tubes for that purpose, in order to keep the joint in place.

Overhead switches or switch-pans should be avoided, if possible, as they become a source of great annoyance. I would strongly recommend a double-trolley-wire for a single-track road.

Great care should be taken in erecting the guard-wire spans. They should be properly insulated from the cross-arm by means of a strain insulator, or something equally as good, and should be of at least No. 6 best galvanized-iron wire. There should be two guard wires over each trolley-wire, at least three feet apart and four feet above the trolley-wire. The guard wire must be well insulated from the guard spans; in case of other wires falling, this would he of great importance.

Pull-off and anchor-guy-wires, or other wires for the same purpose, must be of the very best material and of at least No. 8 galvanized-iron wire.

Feed-in taps must not be more than five poles apart and should take the place of the trolley-span-wire at the point. They should be of at least No. 0 insulated wire.

The trolley-wire being sectional, it is necessary to run a feeder-wire to each section. I would therefore recommend that the feeder-wire he at least 30 per cent larger than the occasion demands. It will be found that this is money well invested. The insulation on the feeder-wire should be the best that can be procured, and I would advise using locust or iron pins with mica insulators, or something equally as good, for the purpose of fastening the feeder-wire to each pole, and great care must be taken to protect it from trees and other obstructions.

A cut-off box should be located on the pole at each trolley-breaker, and should not carry a fuse. It should have the same wire running through it as there is on the outside. The fuses should be at the station, with ampere meter and cut-out switch for each section; then, in case of trouble on any section, the location can be easily seen and that section cut out, if necessary, until repaired.

Lightning arresters are of great importance on the line, and I would strongly recommend using them at least every thousand feet. They can easily be attached to the poles, and can be protected by means of a box.

In conclusion, I would say that no matter what expense is incurred for material, or care used in constructing, a good line cannot be insured without a thorough dally inspection.

It is to be hoped that in the near future a perfect overhead electric construction will be realized in some of our large cities, for the example or fact will be of much more value and interest than any paper on the subject.

New Westinghouse Lamp.

The *Western Electrician* illustrates the new Westinghouse incandescent lamp, of which so much has been said since the decision of the United States Circuit Court of Appeals in New York, upholding the validity of the claim of the Edison General Electric Company as the possessor of the first patent on a practical incandescent lamp. Mr. Westinghouse has met this decision by asserting that he has a new lamp "which not only does not infringe the Edison patent nor any of the patents of the other companies, but is fully covered by patents of our own."

There is no brass at the base of the lamp the butt being of glass. No platinum is used for the leading-in wires, its place being taken, it is said, by an alloy which is claimed to be a satisfactory substitute, and to have a proper coefficient of expansion. The nature of this wire composition is, of course, kept secret. The lamp is a separable one; that is, the filament can be removed and the bulb used over again. This is accomplished by attaching the burner to a ground-glass stopper, which is tightly inserted in the bulb. Then, after the air is exhausted, the lamp is sealed by a peculiar brownish paste. To remove the filament, the lamp is soaked in hot water, which softens the sealing compound and allows the removal of the stopper, which, when refitted with a new burner, can be replaced in the manner described, it being necessary, of course, to again have recourse to the pumping process.

The connection with the socket is made directly through the leading-in wires. The base is of porcelain, and is of extremely simple construction. The binding posts are connected to two spring clips, which are arranged to receive, in the middle portion, the two wires leading from the lamp. Contact is made by turning the lamp so that the wires are at right angles with the spring clips, which are thus forced farther apart, one wire pressing against each strip. A quarter turn of the lamp places the wires parallel and between the strips, which spring back to their normal position, and the light is thus extinguished. The lamp is not screwed into the shell of the socket, but simply pushed in, being retained by springs. It is asserted that that these lanps can he sold at wholesale for 30 cents each.

A PHYSICAL EVIL OF ELECTRIC WELDING.—A section of the men employed at the Kolomna Iron Works, situated near Moscow, has lately had some unpleasant experiences with electric welding, which, with the aid of 500 accumulators, is there practiced according to the Benardos process. While engaged on the trying work, the artificers' eyes were, of course, protected by tinted glasses, but the skin being exposed, the following symptoms were manifested: Burning sensation on the skin and in the eyes; in from three to four hours, discharges from the nose and the eyes; three to four hours later, a dry cough; four to five hours later, swelling of the skin and development of other symptoms; eight to ten hours from the commencement of the disorder, continuous irritation of the eyes, lasting from four to six hours; and finally, coloring of the skin. Then the various effects ceased, and the skin began to peel. On the third day the cuticle had completely decorticated, and by the sixth all the painful symptoms disappeared, but for weeks afterward the skin remained colored. These effects, it would seem, are exactly the same as those which are induced under scorching by the sun. The hest protection which can be afforded the workmen against the evils mentioned, Mons. Maklakoff, the manager of the works, believes consists in a covering of yellow waxed cloth or red and green veils. The electric welders, however, object with characteristic Russian dignity to the assumption of the feminine facial appendages, alleging that, although they may improve the general appearance of the fair sex, they will rather excite ridicule when they are worn by stalwart workers.—Iron.

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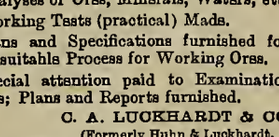

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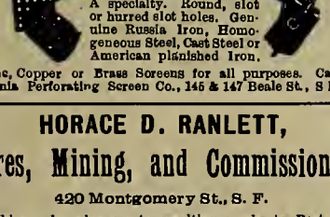

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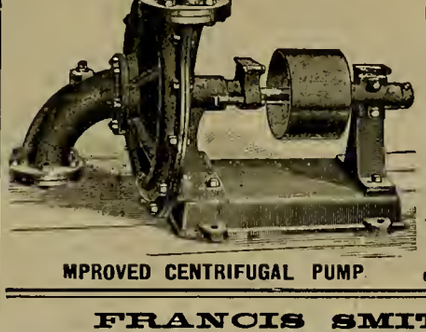

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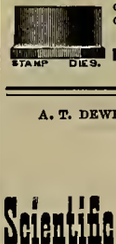

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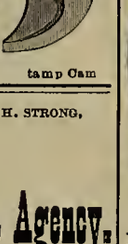

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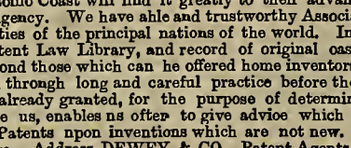

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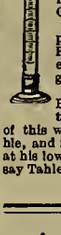

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Ferdinand Allard's method of tempering copper appears to have soon attracted the notice of our naval and military authorities, says *Iron*. Major-General Herbert, the commander of the Canadian militia, and other officers have examined the cutting tools made by the Quebec blacksmith's process, and they are stated to have expressed surprise at the wonderful edge and hardness which had been attained. It was at the General's suggestion, offered in view of the possibility of the discovery being utilized in connection with the armoring of British war vessels, that the inventor despatched a sheet of his hardened copper, 1¼ of a line in thickness, to be tested under the direction of the Lords of the Admiralty, who are alleged to have evinced great satisfaction with the result of the experiments which were conducted with the metal. At a preliminary trial of similar sheets at the Canadian rifle-ranges, the bullet, fired from a distance of 40 yards, was, it is said, shattered into fragments by its first impact with the hardened copper. On the second essay the missile, striking the plate more fairly, was completely flattened, but it remained embedded in the sheet, which it merely dented a trifle, without causing the slightest cracking. Mr. Allard's friends and supporters, who are now numerous, declare that all the tests so far made have proved eminently successful, and that the inventor, amongst other things, has made by his method a copper razor equal in edge and temper to the best article that Rodgers can turn out. How the French-Canadian artificer discovered the secret of his process is related by himself. The narrative has its corollary in the story of Bernard Palissy. "Thirty years ago," Mr. Allard says, "when working at my trade in the United States, I heard a comrade in the same shop remark that the man who could rediscover the lost art of tempering copper would make a fortune. Ever afterwards this saying haunted my mind, and for over 30 years I sought the secret in vain. I made thousands of experiments which ended only in failure and disappointment. A hundred times I vowed that if the next trial failed I would abandon the search, which was wasting my limited means, and seemingly proving a veritable will-o'-the-wisp. At last I decided to make one more attempt, and if that did not succeed, to give the whole thing up forever. An idea of a new combination suddenly occurred to me, and victory was at last mine."

Horses Should Wear Light Shoes.

Horses are commonly made to carry too heavy shoes. The shoe is designed merely to protect the hoof, and the lighter it can be made and still serve its purpose, the better for the horse. Horses that are devoted to farm work, and on land where there are few or no stones, may dispense with shoes, except while the ground is frozen. This would be of great advantage to the horse, to say nothing of the saving in the horseshoer's bill. But most horses require shoeing, and the shoes worn are heavy iron ones. Steel shoes can be made lighter, will wear longer, and the first cost is not so much more that it need prevent their being used. Light horses and driving horses should always use them. For horses of 1,100 pounds weight, and with well shaped, upright feet, the fore shoes should weigh about one pound each, and the hind ones twelve ounces. If four ounces are added to each shoe, let us see what a difference it will make. In plowing, cultivating, mowing reaping and many other farm operations, a horse will walk from ten to twenty miles a day, and advances about four feet at a step. At each step the horse lifts half a pound extra on its two feet, or six hundred and sixty-six pounds in every mile. In a day's work of fifteen miles the horse would lift nine thousand nine hundred pounds extra, or nearly five tons. If the force required to lift this five tons of iron could he expended in the work the horse is doing, much more could be accomplished. In the light of these facts, is it any wonder that when young horses hegln to wear shoes they soon become leg-weary, have their step shortened and acquire a slower walking gait?—American Agricuturist.

LIQUID FUEL.—Another engine fitted with liquid fuel has been running on the Great Eastern Railway, England—one of a class of ten similar express engines—and, as compared with the other nine engines doing the same round of duty, is reported as doing efficient service; that is, the oil-burner has consumed about one-third the weight of coal per mile, and about as much oil as coal in weight, her total fuel being thus about two-thirds by weight what it would be if all coal, and the liquid practically giving an efficiency of double its weight in coal. The engineer's account is interesting in relation to this engine when burning mixtures of plain gas, tar and creosote residua's, warmed up in the tank, which is placed in the rear of the tender, to a liquidity sufficient to cause it to flow freely through the injector-pipes, and to destroy its viscosity so that it would spray finely from the nozzles. Its behavior in the furnace he states to be satisfactory, filling the fire-box with white flame, the air rings also admitting of the most delicate adjustment of the supply of air for effecting combustion without air excess.—*Manufacturers' Gazette.*

Steamers of the World.

The new list of the merchant marine compiled by the Bureau Veritas, which is now in press, gives some interesting statistics concerning the great ocean steamship companies of the world.

Some people will be surprised to learn that the transatlantic lines are not the leading ones in aggregate tonnage or number of vessels. The British India of Glasgow and the British India Steam Navigation Company and the British India Associated Steamers, all one concern, head the list with 103 steamships. Their aggregate measurement is 293,635 tons.

Next stands the Peninsular and Oriental Steamship Company with 36 steamships, representing 216,887 tons. Next in order comes the Compagnie des Messageries Maritimes with 61 vessels, whose aggregate tonnage is 202,522. The fourth on the list is the Norddeutscher Lloyd of Bremen, some of whose vessels ply to this port. This company has 66 steamers, measuring in all 197,169 tons.

Other important lines are the Navigazione Generale Italiana, 106 steamers, 170,755 tons; the Compagnie Generale Transatlantique, 66 steamers, 167,487 tons; the Hamburg-American Packet Company, 56 steamers, 165 442 tons; the Wilson Line, 86 steamers, 158,089 tons; the Austrian Lloyd, 73 steamers, 128,359 tons; the Allan Line, 39 steamers, 123,038 tons; the Spanish Compania Transatlantica, 34 steamers, 94,163 tons; the White Star, 20 steamers, 95,370 tons, and the Cunard, 26 steamers, 85,913 tons.

STEEL FRAME BUILDINGS AND FIRES.—A Chicago building of the present style of steel frame construction has come safely through a severe fire test. The nine-story fireproof building of the Chicago Athletic Club caught fire Oct. 31st, and the fire was very hot, owing to the quantities of barrels and lumber in the lower floors, while the upper floors were in the hands of the carpenters and plumbers. The following is the published statement of an official of the insurance patrol: "As far as we can see, the building itself is all right. The big girders are not bent, the brick floors are not broken, and nothing has gone up but the slight brick partitions and the brick casing around the pillars. A few unimportant scantlings, that held the partitions in place, are bent and must be replaced. On the whole, the building is as sound as ever." The following remarks are credited to Mr. Charles Clark, the superintendent, who has represented Mr. Cobb, the architect, during the construction of the building: "I never knew a building to stand fire so well in my life. Of course the lumber and stuff inside burnt, and, everything being unfinished, there was nothing to prevent the fire rushing from the bottom to the top. As to the stone front falling to pieces, there is no stone which will stand fire and water combined."—Engineering News.

CLEAR, CONCISE STATEMENT IN DEMAND.—A professor informs us, says the *Baptist and Herald*, of Dallas, Texas, that science has now immediately before her three great prolems to tackle. The first is to produce electricity directly from coal; the second is to produce for illuminating purposes the "beautiful, soft beaming light of the firefly and the glowworm," which illuminates without heat; the third task is air navigation. With these undertakings inventors must wrestle victoriously before there is any remarkable improvement in mechanical science. That is all well. But there is one problem as mighty as any which it does not mention. That makes four for the coming man of science to solve. The fourth problem is to find a way to make professors of science and philosophy write plain, short, decent sentences, such as people can understand. The tremendous waste of gray matter, brain cells and "potential energy" involved in the attempt to make head and tail of scientific and philosophical writing as far exceeds the waste of fuel in producing steam as 10 exceeds 1. Take a sentence in this very magazine article. The reader begins it. He gets muddled and glances back to the beginning. It is so far off that he has a curiosity to count the words in it. There are 185; nearly half a page, and it wasn't a very very good day for sentences either.

SOLDERING ALUMINUM.—The property of aluminum which renders soldering so difficult is very probably its easy evidation. Although apparently resisting oxidation very strongly, yet if we take the word of those who have studied the subject closely, this resistance is not a simple process. It is believed that the instant a clean surface of aluminum is exposed to the atmosphere, it is instantly covered with a film of oxide, which, being continuous and unalterable, protects the metal beneath it from further oxidation. The film of oxide acts effectually to prevent any other metal from coming in close enough contact with the aluminum beneath to alloy with it, and thus soldering is prevented. The use of a flux to dissolve this oxide was tried under all conditions, but none have been found practicable. In casting about for a practical solution of this problem, Joseph Richards, of Philadelphia, reached the conclusion that the solder should contain its own flux, so that the instant the film of oxide was removed, the solder proper would be simultaneously present to take hold of the aluminum surface at the same instant that it was cleansed from oxide. Upon adding a percentage of phosphorus to the alloys heretofore used, far more satisfactory results were obtained. The nature of the work which could thus easily be performed with these solders led to the issuing to Mr. Richards of letters patent to the use of a deoxidizing agent, such as phosphorus, in solders, and on the strength of his experimental work, Mr. Richards now presents the claim that he has made a satisfactory solution of the problem of aluminum soldering.—Am. Manufacturer.

IN experiments on the influence of food and surroundings on the color of animals, Mr. E. B. Poulton reared caterpillars of the pepper moth under different conditions. Those confined among green leaves and twigs become green, those having black or brown twigs mingled with their food were brown or black, and others were turned light-colored by white pepper. With artificial colors, red and blue tended to produce a dark coloration, though, very strangely. painted twigs had not the same effect as those with the same natural tints.

THE year of greatest growth in boys is the 17th; in girls the 14th. While girls reach full height in their 15th year, they acquire full weight at the age of 20. Boys are stronger than girls from birth to the 11th year; then girls become physically superior until the 17th year, when the tables are again turned, and remain so. From November to April children grow very little and gain no weight; from April to July they gain in height but lose in weight, and from July to November they increase greatly in weight, but not in height.

PHOTOGRAPHY is now being made to record the movements of the growing parts of plants. Especially curious are the results with certain climbers, such as the hop convolvuls, isomoea, etc. The young stems move in a succession of irregular circular or eliptical curves, which vary every moment, even in direction, and are due to irregular growth in different parts of the stem. During the sleep of plants movements do not cease, but consist of alternate upward and downward vibrations.

IRON SLEEPERS.—In appears probable that Iron sleepers will in due time be used on an extensive scale in Austria. The State Railways Administration, it is reported, has contracted with the syndicated Austrian railmills for a large supply of metal sleepers at a price but slightly inferior to that paid for steel rails, with the proviso, however, that a lower rate is to be accepted should the demand exceed 25,000 tons. It is stated, moreover, that the Southern railway is inviting tenders for the supply of 35,000 iron sleepers.

THERE are 13 stars, 13 letters in the scroll held in the eagle's beak, 13 marginal feathers in each wing, 13 tail feathers, 13 parallel lines in the shield, 13 horizontal bars, 13 arrowheads in one foot and 13 letters in the words "quarter dollar."

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ors is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat o furnace, want of sulpbur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings, and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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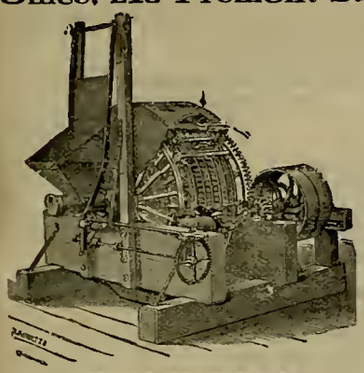

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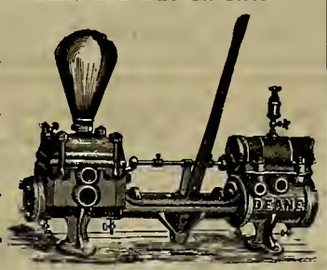

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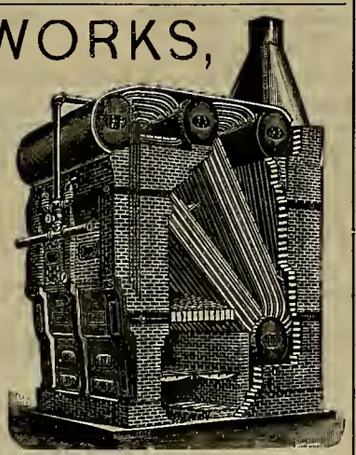

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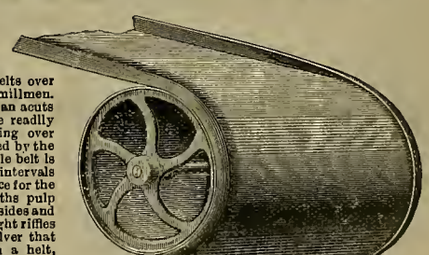

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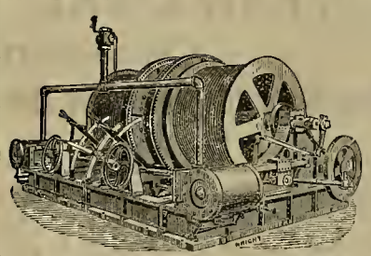

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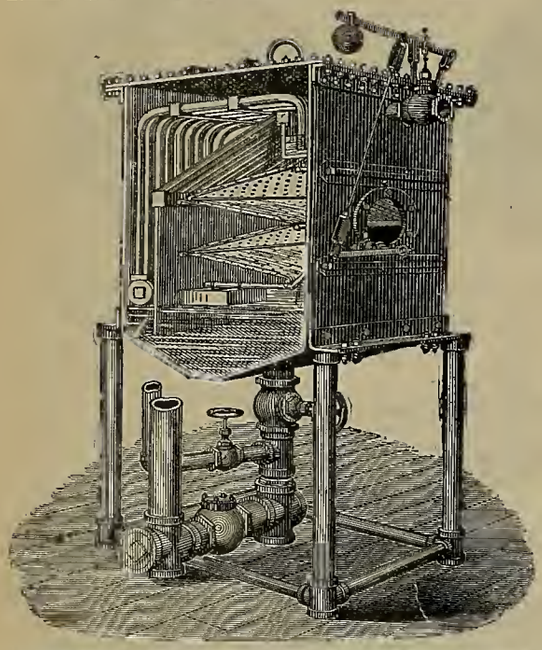

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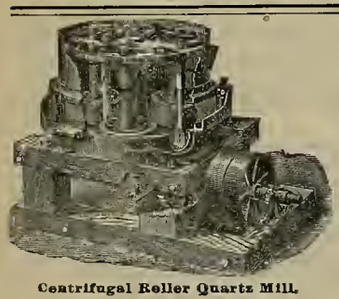

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

BAY STATE.—Amador *Record*, Nov. 19: The fine outlook at the Bay State mine is creating considerable stir in Plymouth district. Things bad been going wrong so long that people thereabont were pretty badly discouraged, but now they seem to be taking a turn for the better and everybody is talking quartz. There are a number of good ledges around Plymouth, and the people who own them are taking active measures to develop them. It would not be surprising if Plymouth became a livelier town than any of its neighbors in the near future.

PIONEER DISTRICT.—Amador *Ledger*, Nov. 14: This district is experiencing something of a boom in mining matters. The Pioneer mine, under its new owners, who are also connected with the Clinton Consolidated, is being developed with vigor. The work now in order is sinking. The shaft is going down on the ledge, and is at present 150 feet deep, and it is the intention to go at least 100 feet more, and from that depth to do considerable prospecting, with the view to ascertain the chances for permanency. The sinking so far has shown a ledge of fine-looking rock two or three feet wide. They are running with an air-compressor and machine drills, operated by a small engine. A large boiler, 25 feet long, arrived on the ground last week for the purpose of replacing the old one. There are from 15 to 20 men employed about the mine. The Modoc is also sinking, with fair prospects. The ledge is five feet wide. Gracey's roller mill is being fitted up to crush ore from Joe Leduc's claim, which is the south extension of the Modoc.

PINAVETTA.—This mine is situated one mile above West Point bridge, and is owned by Scott & Stirnaman. They are down 90 feet, with an ore-body of excellent pay rock two feet wide. Some of the rock has been shipped below for treatment.

AMADOR VIEW.—This mine is northeast of Pinevetta, and is owned by Messrs. James & Stirnaman. The shaft is 70 feet deep, and the vein runs from ten inches to two feet in width. It has been followed a distance of 90 feet, and holds its own in strength and quality. Several crushings have been made at the five-stamp mill on the property, which yielded an average of over $100 per ton. The mill is idle at present for want of water.

VOLUNTEER.—This property, which adjoins the Kennedy on the east, was lately bonded by A. P. Minear. Mr. Minear has made arrangements for the development of the claim, and operations were commenced this week. There is a shaft, about 150 feet, and this is to be repaired at once. The timbers are found to be utterly worthless, above water level, and will have to be replaced with new ones. Timbers for this purpose are being hauled, and the operations are to be pushed ahead as fast as possible. Mr. Minear is sanguine of opening up a paying mine here. It is not claimed that the Volunteer is on the line of the Kennedy ledge, but is a parallel vein. This, however, is no reason why it should not be a rich property.

MISCELLANEOUS.—J. T. Wheeler has commenced work on a deep gravel mine, about half a mile west of Pine Grove. The gravel is 50 or 60 feet from the surface, and can only be operated by drifting, on account of lack of water. It has not been worked for many years, although believed to be very rich.

Butte.

BANGOR.—Oroville *Register*, Nov. 19: The Morning Star Company has struck bedrock and is now drifting to reach the gravel channel. The bedrock is pitching to the north. The Grove Company is now down 150 feet and will have to sink the shaft about 50 feet farther before bedrock will be reached. The Turner Company sunk a shaft, but the water came in so rapidly that it could not be worked to advantage, and this was abandoned and a second shaft sunk 150 feet farther west. Bedrock has been reached in this, and the company is now drifting toward the east to tap the gravel beds. The Catskill, Bishop, and Hay & Clark mines are now taking out gold and getting good returns. Work is being pushed ahead in the Wheeler gravel mine on Wyman's ravine, and the shaft is now down 110 feet and drifts are being run in different directions to develop the channel. The paygravel is from three to four feet thick, and the bedrock is still pitching. There is no water to prevent work, and the machine will soon be completed and ready for operations. Mr. Wheeler says it will be about two weeks before they begin washing gravel. Wm. Conner, or "Wild Bill," as he is better known, found a silver lead in the hills last summer that promises to yield big returns when the lode is developed. He is going up in a short time to do some work on the ledge, for he had two assays made, and one of these showed the ore to contain $1863 and the other $2223 a ton. The company that was sinking the shaft upon the Mansfield mine near Wyandotte will shortly put in a power pump, and then run drifts from the bottom of the shaft to prospect the gravel.

ATTACHED.—Oroville *Mercury*, Nov. 18: Hay & Clark's mine at Bangor, the Blue and Gold, was attached yesterday by the Sheriff on an execution issued out by George Batts for $450. Of course this had the effect of closing down the mine and a number of men who have been employed there came to town to-day. In conversation with a *Mercury* reporter, one of them stated that the firm was considerably involved to laborers and other parties, probably to the extent of three or four thousand dollars. He says that the mine is rich, but the process employed in saving the gold does not work satisfactorily and the mine has been operated at a loss for some time. It is believed that by using a different process the mine would pay large dividends. Two of the miners employed, Ed. H. Riley and W. P. Jones, have filed liens against the property for wages due to the amount of $134 and $118 respectively.

Calaveras.

MILL STARTED.—Calaveras *Chronicle*, Nov. 19: The Herrold mine, formerly known as the "Leavitt," has got a five-foot Huntington mill running in good shape, and, as we are credibly informed, all indications point favorably to success. This mine has, in former years, paid large dividends to its owners for the surface workings, the rock extracted and packed to the Mokelumne river and worked by arrastre process yielding from $20 to $50 per ton. Capitalists have, for some unexplained reason, steered clear of this property until about one year ago E. J. Elzy, of Oakland, Cal., secured a bond and finally formed a company to purchase the mine for a mere song. Good management has prevailed, and to-day the developments show a tunnel 750 feet in length on the lead exposing a fissure filled with blue-ribbon quartz averaging 7½ feet in width. The mill has been running but five days, the plates of which are heavily coated with amalgam, which indications are far better than the anticipations of the owners. The usual activity is shown in and about the mine in the way of improvements. New houses are springing up, and in a short time the outside equipments will be all furnished. The principal owner of the property, Mr. Joseph Davis, of San Francisco, is at present at the mine and will arrange his business to spend a portion of his time at the property. At present he is having erected a residence and office.

TO START UP.—We learn that active operations are to be resumed at the Riverside mine at West Point, under the direction of San Francisco capitalists. The mine, which is said to be a good one, has been idle for over a year.

Inyo.

THE CYANIDE PROCESS.—Inyo *Independent*, Nov. 18: Frank Mathews arrived last Monday at Lone Pine from Eureka, Nevada. He is interested in the new cyanide process for the reduction of gold ores, and is connected with mines where it is in operation at Eureka and in Utah. Mr. Mathews is now arranging with J. Wilson to work ores in his mines in Coso district. The Hirsch mine, the mines in Hunter's canyon and other mines in Beveridge district will also be examined, with a view to work ores by the new process. Mr. Mathews left Independence yesterday with Mr. Wilson for Darwin, with intention to begin work as soon as possible. In different parts of the country there are gold ores in abundance that may pay good profit by the new process. Should the result prove successful it would be of much local benefit.

Mono.

THE BODIE CON.—Bodie *Miner*, Nov. 19: During the week east crosscut No. 1, 550-foot level, was extended 7 feet. Upraise from No. 2 north drift, 300-foot level, was extended 5 feet. North drift from above upraise was extended 9 feet. West crosscut, 200-foot level, was extended 7 feet. We are putting in a new pump-bob foundation at the 300 Lent shaft; the timbers of the old foundation are all rotten.

THE MONO.—During the past week south drift, 550-foot level, was extended 10 feet. West crosscut, same level, was extended 9 feet.

Nevada.

FINE GRAVEL STRUCK.—Nevada *Transcript*, Nov. 19: Rich gravel has been struck in the Odin drift gravel mine, situated on Selby hill, near this city. The strike was made in the upraise from the main tunnel that leads from the incline, at a point about 150 feet from the incline. Prospects made of three different carloads went at $1.50, $16 and $29 per car, which is exceedingly rich, and from the pitch of the ground it is thought that the channel will prove to be very large. The upraise already extended along the channel 100 feet, and the character of the gravel has improved steadily as work progressed. From all present indications, the Odin will be one of the best-paying mines in the county before long. There are now only 16 or 18 men employed, but as soon as the mine is opened, so that more men can be put to work, the force will be considerably increased. The new machinery at the hoisting works is working smoothly, and everything about the mine is being done in first-class manner under the efficient superintendence of Carl Hesse, C. E.

IMPROVEMENTS AT THE NORTH BANNER.—Grass Valley *Union*, Nov. 20: The North Banner Mining Co. has purchased an air-compressor and power drills, which are to be put in with the least delay possible. The reason for introducing this machinery is to expedite the work of crosscutting and drifting on the veins that are now being opened on. For months past the company has been engaged in crosscutting from the Banner vein into a series of veins that parallel it. One of these veins was cut at a distance of about 200 feet, and a pay shoot struck which gives good-milling quartz carrying free gold. The drift is being extended on this vein, which averages a foot in width. At the same time a crosscut has been run a distance of 60 feet for another vein in the series, and 100 feet more will have to be run before the vein is struck. Beyond this is another vein to which the crosscut will be extended. All of these veins have been prospected on the surface with good results, and at the depth at which they are now to be opened will furnish a large quantity of ore that will mill profitably. The country rock between the veins is hard, and because of this, and to expedite the work, the compressor and power drills are being introduced. The compressor is to be set up in the adit level of the mine at the head of the incline shaft, and will be operated by waterpower. At the present time all the work on the mine is carried on at a level with the tunnel, and no hoisting or pumping has to be done. The present plans of the company contemplate a very extensive development of the several veins belonging to the system, and which will give a large output of ore at a moderate cost when the crosscut is completed and the different veins opened upon. At the present time the ground is not opened sufficiently to furnish ore to keep the mill going constantly, but the clean-ups that are made are very satisfactory.

Plumas.

A RICH MINE.—*National-Bulletin*, Nov. 19: From R. L. McGill, one of the owners of the McGill & Standart Consolidated quartz mine, who was in town Wednesday, we gleaned some interesting news concerning that important mining property, which is situated west of Greenville, near the head of North canyon and a short distance below the Round Valley reservoir, the property of Messrs. Bidwell & McGill. The mining property consists of five locations, all patented. Connected with it is a tract of timber land comprising 640 acres. The work of extracting ore from tunnel No. 2 has been progressing all the past summer. The quartz is hauled to the Kettle mill, a distance of one-half mile, at a cost of 30 cents per ton. The ore is mined very cheaply, only three men having been employed in breaking sufficient ore to keep the 20-stamp mill running, and it crushes 30 tons per day. The average yield has been $6 per ton. Tunnel No. 2 is in 1500 feet, and about half-way across the Pacific location. Good ore is in the face of this tunnel, and Mr. McGill says there is a three years' supply in sight in this tunnel alone. During the progress of work in tunnel No. 2, a lower tunnel, No. 3, nearer the bed of North canyon, has been pushed forward, and is now into the mountain 800 feet. A chimney 80 feet long, and containing $20 ore, has been run through. Owing to the steepness of the mountain, the ore from this tunnel cannot be hauled to the Kettle mill; hence, as early as possible next spring, Messrs. McGill and Standart will erect below the mouth of tunnel No. 3 a 20-stamp mill. By so doing they will have command of a body of rich ore which should last for years.

JAMISON.—From Sam. W. Cheney, Supt. of the Jamison mine, we learn that active work, except contract work, will not be prosecuted in that mine during the winter months, but will be resumed next spring.

Shasta.

MINING NOTES.—Redding *Free Press*, Nov. 19: On Thursday of this week Charley Bailey and H. M. Perham hauled a couple of loads of machinery to the Flat Creek mines. Mr. Simoni, owner of the Gem mine in the Lower Springs district, is pushing ahead an 800-foot tunnel from the Middle creek side to tap his ledge at great depth. The Iron Mountain Mining Company shipped this week by Wells, Fargo & Co. 13 silver bricks or 2145 ounces. It is scarcely a month since the last shipment was made. The Crown Point Co. is preparing to put in concentrating works at the company's mines on Mule mountain. A force of men is driving ahead on the tunnels and general activity is reported. The Connor group of mines on Salt creek have been bonded to Mr. Miryansky for $15,000, the money to be paid in installments. Mr. Miryansky has two shifts of men working day and night. Captain Clark of the Gladstone Company put 60 miners to work this week taking out ore and prosecuting tunnel work, and the mill is running night and day. The shut-down last week, it appears, was only temporary. Connor & Son are opening up the Phœnix location, a short distance from their former operations on Salt creek. In a depth of 12 feet they have run on to a strong ledge of quartz, rich in coarse gold and easy to work. It is claimed that since the Sierra Buttes Mining Company purchased the Uncle Sam mine a net profit of $148,000 has accrued to the stockholders. This speaks well for Shasta county mines and for the able management of the company. Peter Scherer has succeeded in disposing of a large block of mining stock of the Eureka tellurium, and will erect a 10-stamp mill, put in concentrators and proceed to work the ore. In fact, grading for the mill has been completed, and he has built a tramway to the mine. Colonel Lyons returned from St. Louis Thursday morning. He was accompanied by his family. He informed us that while in St. Louis he organized the Rich Gulch Gold Mining Company; place of works, Old Diggings, Shasta county. The capital is $1,000,000; number of shares, 100,000, at $10 per share. The company was organized under the laws of Illinois. The first work to be done by the new company is the running of the tunnel from the west side of the mountain, which will open up the mine at a great depth and tap all cross ledges. Upon opening up a good body of ore the company will erect a mill and put in the necessary machinery required to work the ore. Mention was made last week of the discovery of ore highly charged with sulphurets in the bottom of the old Spanish shaft of the Reid Mines Consolidated Company. Colonel Stevenson, the superintendent, being anxious to know the value of the ore, had the samples tested by two reliable assayers in San Francisco, and the returns far exceeded his most sanguine expectations. One sample went $552 in gold and 11 ounces in silver; the other, $603 in gold and 29 ounces in silver. The ledge, which started in at 18 inches wide, has increased to two feet, the shaft being down about 70 feet, or 20 feet below where the ledge came in. It is the intention of the company to sink this shaft 500 feet and then crosscut their six ledges for 1000 feet, which will give them 1100 feet of ore backs. The company has $55,000 of treasury stock, the proceeds from the sale of which will be used in developing the mines. The rich ore discovered makes Colonel Stevenson feel quite elated, as he will be able to ship the ore at good profit and thus pay a dividend on the stock sold.

Sonoma.

HEALDSBURG PAINT MINE.—Sonoma *Tribune*, Nov. 19: The directors of the company a few days ago effected a lease of ten years with James E Fowler of Oakland, by which the latter binds himself to pay a stipulated royalty for each ton of ore taken from the mine, with the option of purchasing the mine at any time during the year, also to pay a stated amount each month, whether ore is extracted or not. All the stockholders signed this lease and the same is on file in the Recorder's office at Santa Rosa. On Thursday last men and mining tools came up from Bodega and work was commenced. It will be remembered an assessment was levied in 1891 and the amount was expended in driving a tunnel into the ore deposit. This was run 93 feet in the ore bed and some fine ore extracted. Mr. Fowler, hearing of the mine, visited it, was favorably impressed and leased the same, as stated above. A tunnel has been started farther down the hill, so as to strike the ore at a greater depth than the one run last year. The work of developing the mine will be prosecuted during the winter. Three hundred feet from where the tunnel has been started the ore bed shows on the surface a width of 96 feet. Reduction works will be erected either in Healdsburg or in the vicinity of the mine.

NEVADA.

Washoe District.

CONE. CALIFORNIA AND VIRGINIA.—*Chronicle*, Nov. 19: There has been extracted from all parts of the mine during the week 967 820-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $26.32 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $23.02 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $16,460.85.

OPHIR.—1465 level—We have continued to work north from the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 feet below the sill floor of this level, and have extracted therefrom and raised to the surface 53 tons of ore, the average assay value of which is $27.30 per ton. At one point in our working in this locality we have stoped out upward to the height of 12 feet above the sill floor, and there the ore deposit seemed to give out and changed into a porphyry formation.

MAXICAN.—On the 1465 level the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 18 feet; total length, 303 feet; continuing in a porphyry formation with lines of low-grade quartz.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift, has been extended during the week 24 feet; total length west from the joint shaft, 2637 feet. The face is in porphyry.

UTAH.—340 level—The north drift from west crosscut No. 2 has been extended 20 feet; total length, 186 feet, continuing in vein porphyry, clay and stringers of quartz.

SIERRA NEVADA.—Are stoping north in the Cedar Hill drift. Some fair-grade ore has been found. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 24 feet, making the total distance west of shaft, 2637 feet; the face is in porphyry.

ANDES.—North drift from east crosscut No. 1 north, on 420 level, advanced 15 feet; total, 47 feet; formation, soft porphyry.

BEST & BELCHER.—West crosscut No. 2 has been advanced 16 feet; total length, 76 feet; formation passed through was soft porphyry and stringers of quartz.

GOULD & CURRY.—West crosscut No. 5, 432 feet from main west drift, has been advanced 17 feet; total length, 103 feet. Have also repaired north drift, from west crosscut No. 3, 30 feet during the week. On the Sutro tunnel level, the joint north drift with Savage Co. has been advanced 15 feet; total length, 685 feet; face in hard porphyry.

HALE & NORCROSS.—We continue retimbering main shaft at the 800 level. During the week the west drift on the 150 level of the old or A-street workings was extended 17 feet, making its total length 72 feet.

POTOSI.—The raise from No. 1 crosscut, 1100 level, is up 65 feet; the ore in the top is four feet wide, the average ore samples of which assay $40. The east crosscut, 50 feet south of the Potosi winze, 1150 level, continues in porphyry. During the week we have been occupied in repairing the Ward shaft and in laying a pump column along the northwest drift from the Ward shaft, 1800 level to the Potosi winze, preparatory to pumping the water from the shaft through the winze to the 1500 level, and thence taking it to the Sutro tunnel. This water has heretofore been tanked to the surface at great expense. Extracted and sent to the mill the past week 417 tons of ore from the 550, 930 and 1500 levels. Milled during the week 400 tons. On hand at mill, 76 tons, 900 pounds. Average battery assay, $28.29. Shipped to the Carson Mint, 372½ pounds of crude bullion.

CHOLLAR.—We are repairing upraise from 350 to 250 level, also the main shaft from the 930 to the 850 level. The east crosscut, 160 feet south of north line, 930 level, is out 27 feet; face in porphyry and clay.

BULLION.—The west crosscut from north drift, from top of raise from east crosscut, 320 feet south of north line, 1300 level, is out 19 feet; face in porphyry and quartz that gives low assays.

ALPHA.—The past week has been occupied in repairing the Ward shaft and in laying a pump column along the northwest drift from the Ward shaft, 1800 level, to the Potosi winze, preparatory to pumping the water from the shaft through the Potosi winze to the 1500

level, and thence to the Sntro tunnel. This water has heretofore been tanked to the enrface at considerable expense.

EXCHEQUER.—The paet week hae heen occnpied in repairing the Ward ehaft and in laying a pump column along the northwest drift from Ward ehaft, 1800 level, to the Potosi winze, preparatory to pnmping tbe water from the shaft throngh the Potosi winze to the 1500 level and thence to the Sntro tnnnel.

WARN SHAFT.—The past week has been occnpied in repairing the Ward shaft and in laying a pnmp column along the northwest drift from the Ward ehaft.

OCCIDENTAL.—We have discontinued the milling of ore for the season and bave closed the mill. Have resumed work in the sontb drift on tbe 750 level and are driving the main nortb drift on tbe same level through low-grade quartz. Have started No. 2 in the Zadig drift, Sutro tunnel level, at a point near the end of the drift.

NEW YORK.—The winze on the 650 level is down 73 feet on the slope; bottom in low-grade quarlz. Are taking out 10 cars of ore per day, car samples assaying from $35 to $40 per ton. The west crosscut, 50 feet north of ebaft, 800 level. is ont 21 feet; face is in clay and porpbyry.

SILVER HILL.—We are repairing tbe northweet drift, 260 level. Shipped to Carson Mint in paet week, 170⅜ pounds of crude bullion.

ARIZONA.

PROFITABLE RUN.—Arizona *Gazette*, Nov. 19: The latest rnn of the Bonanza mill at Harqua Hala, in 25 days brought to Hubbard & Bowers a neat $55,000 brick—not a bad showing for such an economically-conducted property.

A BIG STRIKE.—Tombstone *Epitaph*, Nov. 19: A. Baner came in last night from his mines in the Golden Rnle district. He bronght with him a few pounds of rock from a new find he made upon the gronnd of one of his claims. He fonnd a few small pieces of float a few days ago, and as it looked well be followed it up and found a ledge six feet wide of lead ore which is pronounced by those who have seen it as being one of the biggest proepects in the county. Assays made give a result of 84 oz. silver and 41 per cent lead per ton. There is said to be a thonsand tons in sight and the ore is being eacked and piled up for shipment.

BRITISH COLUMBIA.

BEOAME RICH BY ACCIDENT.—Seattle *Post-Intelligencer*, Nov. 11: J. H. Moran is at the Rainier, having jnst retnrned from the Slocan mining district with a nnmber of rich specimens of lead ore from that region. Last June he went up to that country a veritable tenderfoot, never having seen a mine, on a prospecting tour. The second day after his party had located a camp and gone to hunting for eigns of ore, he lost his companions, and being somewhat fearful of bears, of wbich there are plenty in that region, he thougnt it best not to go farther from camp, and sat down to wait for his partners to return. While waiting for them he picked up a small boulder in mere idleness. He was strnck with its great weight, and broke it in two, when he saw that it was nearly pnre galena. He picked np others, and a short distance np tbe hill he found the ledge whence the float had come. And thns he became rich. His ore averages $130 per ton; it cost during the snmmer to ship it by packing on caynses, boat, railway hanl, treatment and import dnties abont $100 per ton. "During the winter, however, thie expense will be greatly lessened," said be, "by dispensing with the pack animale and hauling the ore to the boat on Arrow lake by sleds. About a score of claims will be worked all winter. I have come down for the pnrpoee of laying in a winter's stock of snpplies, and ehall retnrn again in a few days. I am not sorry that the Democrats have carried tbe day in the elections this year, because if they take off the duty on lead ores it will make onr ore worth about $30 a ton more to us, and will give a greater impetns to American mining in British Columbia."

IDAHO.

CLEAN-UP.—Silver City *Avalanche*, Nov. 16: The new Trade Dollar mill is a "dandy." Tbe resnlt of a ten daye' rnn from a partial clean-up amounts to fully $30,000, and a saving of from 95 to 95½ per cent of the valne is made. The concentrates have a value of over $5000 per ton. Four 4-horse teams are engaged in hanling ore from the mine. The first month's run of the new mill will amount to $100,000. The Blaine tunnel has at last ent the Trade Dollar ledge at a distance of nearly 1900 feet from the mouth of the tunnel. The ledge ie of good widtb and shows the same cbaracter of quartz as fonnd in the upper workinge. No assays have yet been made. Tbe ore-body is over a foot wide in the face. The stope on the Blaine ledge is looking well, considerable rock being sacked for ehipment and also hanled to the mill for reduction.

BLACK JACK.—The Black Jack mill started np on the 1st inet., and is running eteadily. Concentrators have been added to the plant, and a large percentage is now saved. Wm. Davis hae been doing some work on a property of his located in Whieky gnlch. Abner Enoch is in from South mountain and reports everything looking favorable. He bas bad an assay made from his Carbonate claim, which resulted $107 in silver. The ledge is four feet in width. The property is developed by an 80-foot shaft and a 25-foot tnnnel running from the shaft at a depth of 40 feet.

OREGON.

THE QUARTZ-MILL RUNNING.— Ashland *Tidings*, Nov. 18: The new quartz-mill of the Ashland Mining Co., at the old planing-mill on Mechanic street, was started Tuesday and everything fonnd to work to a nicety. Wednesday the mill commenced running regularly, crushing qnartz, and its buey hnm is pleasant mueic to the people of Ashland now.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Nov. 23, 1892.

General trade the past week under review was quiet in all lines except those peculiarly adapted for the holiday trade. It is quite generally claimed that this season's holiday purchases will be lighter than they were last year. This opinion is grounded on the prevailing idea that the public is still economizing, and therefore smaller expenditures can be looked for during midwinter. Farm produce has been receiving only a fair degree of attention. This is largely due to the year drawing to a close and also to restricted supplies and no strong selling pressure. Dry weather up to to-day has had an unfavorable effect on all branches of trade, but if the rains to-day continue and also become general, the feeling of uncertainty and uneasiness regarding a dry winter will be dispelled.

The local money market does not present any changes deserving particular mention. The feeling of uncertainty still predominates, although there are indications of a gradually growing feeling of confidence. There appears to be a mistrust regarding congressional legislation, and until the 52d Congress is a thing of the past, and an extra session talk is decided as ill-advised, it is hardly likely that the feeling will be allayed. There is a very general feeling that if an extra session of Congress should be called, more or less hasty legislation would follow which would probably tend to the further cnmplication of both business and financial affairs; but if affairs should be allowed to run along as they now are until the regular session of 1893-94, then the general situation would have adjusted itself to the expected changes. It is said that there is still a steady increase to the bank reserve, with no corresponding inclination to put out funds until after the turn of the year. It is quite generally conceded that the disbursements in January, 1893, will aggregate larger than did those in January of this year. What this opinion is grounded on, it is hard to say, for, as a rule, the earnings of large incorporated companies do not show much, if any, increase this year over the earnings in 189r.

Eastern mail advices report a continued activity in trade circles witb manufacturers, as a rule running on fuller time. This seems to apply to nearly al branches of manufacturing enterprises. The advices also confirm telegraphic information of an advance by several manufacturers in the wages of employes. The advance, it is said, was not generally looked for, and therefore greatly surprised commercial and financial writers. The higher wages paid by the balf dozen or more manufacturing companies, it is tbougbt, will be followed, after the turn of the year, by others. It can be only a question of a short time before this change for the better will make itself more generally and beneficially felt. New York advices report that money had a firmer tendency. Time loans were in abundant supply, but rates were firmer at 5 per cent for thirty days, 5½ for sixty days and 6 for longer dates. Commercial paper was in better demand, more of the New York banks being in the market. The imports of merchandise at New York for October amounted to nearly $50,000,000 exclusive of specie, whicb is nearly $7,000,000 in excess of the corresponding month of last year, and were larger than for the same month of any previous year wit the single exception of 1890. Exports decreased in a still larger proportion, the shipments of produce and merchandise having been only $31,000,000, against $37,000,000 for the same montb of last year. The first four months of the fiscal year have, on comparison witb the corresponding period last year, gained $22,957,204 in imports of merchandise, but have lost $22,538,521 in exports. From present prospects when the returns from all tbe ports are in the ten months' statement will be less favorable than last year, wben the balance of trade was over $100,000,000 in favor of this country.

The International Monetary Conference commenced its sitting yesterday, November 22, at Brussels. It is quite generally conceded that the discussions pro and con on metallic currency will take on an enlarged form, which will probably some time in the near future, lead up to a general international monetary agreement. While this is the generally expressed opinion regarding the outcome of the conference, yet there are many of the ablest financial writers who contend that before this desideratum is attained a severe lesson will have to be taught the gold-using countries, and this lesson will be in the shape of a financial panic which will rock to their very center England's commercial and financial standing. This portion of the writer's opinion appears to have been taken after a careful survey of the situation abroad, and the well-established fact that the outstanding paper obligations of each country in Europe largely exceeds the metallic reserve that can be used for redemption purposes. Be the above as it may, yet it must be conceded that the proceedings of the Conference will throw much light on the situation, and therefore be closely watched by all interests.

SILVER—The market has held around quotations which have ruled during the past two weeks. The action of the market at home and abroad indicates that operators are waiting the general decision of the International Monetary Conference. While the consensus of opinion is that the majority of the delegates to the Conference will throw their influence toward an international agreement to ennoble silver, yet from the fact that the action of the Conference will not be binding on any country represented, the conclusions arrived at will lose much of their importance, and any benefits derived from a favorable action will be lost in the near future. If this shall prove to be the case, then any person or persons acting on the action of the Conference will hazard considerable, for until bimetallism is adopted by leading countries, the market value of silver will continue to be controlled by speculators. The free coinage of silver, confining it to the product of this country, it is now stated will come up in the 52d Congress, and probably be acted on before the close of January, 1892.

MEXICAN DOLLARS—The market has held steady at arnund 67¼ cts.

QUICKSILVER—Receipts the past week aggregate 295 flasks. The market has been fairly steady. It is said that there has been some quiet buying lately, whether for speculative purposes or for more general use owing to the favorable outlook for hydraulic mining.

BORAX—Receipts the past week aggregate 733 ctls. The market is steady, with continued free shipments overland.

LIME—Receipts aggregate the past week 2207 bbls. The market is steady at from $1.25 to $1.50 per bbl.

ANTIMONY—The market is slow at unchanged quotatinns, both in this and the New York market.

PIG LEAD—The market is fairly steady. From first hands in round parcels the market is quoted at $3.85; jobbing at quotations.

PIG IRON—The market is essentially unchanged. The stock on band is going gradually into consumption. Eastern mail advices report a quiet but steady market. Imports the past week aggregate 250 tons from Newcastle, England.

TIN—It is said that some quiet feeling is going on for later delivery of both pig and plate. English advices report plate-makers firmer in their views, with a disposition to advance prices. Eastern advices repnrt an inactive market, with buyers and sellers apart.

COPPER—The market shows more firmness, with an upward tendency. A London cable to *Iron Age*, Nov. 17, says: "Prices for merchant bar copper have advanced about £1 during the week, and the impression is stronger that producers identified with the movement to restrict production are gradually gaining the upper hand. There has been more active buying for India, and that, along with liberal purchases on American account, has helped the upward movement in prices. Additional stimulus has been imparted by the reports that the reduction of American output is assured, and a further report that American operators have purchased freely here since the rumored stoppage of the Montana works also carries some weight. Reduction of output in the latter quarter, it is argued, will hamper English smelters, and bids on furnace material, as well as on bars, have been somewhat higher. There has been a lively demand for furnace material. Consumers' stocks are light and supplies elsewhere appear to be very moderate. Decidedly higher prices are asked for future deliveries. The European visible supplies of copper have decreased 1722 tons during the past fortnight, and a falling off of 1422 tons in spot stocks is also recorded.

COAL—Imports the past week aggregate as follows: Seattle 2433 tons, Coal Bay 10, Tacoma 4700, Swansea 2600, Nanaimo 3677, Coos Bay 800; total, 14,221 tons. The market bas held to firm prices throughout the week for both steam and household. The demand for the latter bas enlarged. Foreign coals, it is said, show an advancing tendency.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13¾	English, lb	— @ 18
BORAX.		Canton tool	— @ 8¼
Refined, in car lots	— @ 7¾	S'k Diam'd tool	8¾@ 15
Powdered, do	— @ 7¾	Pick & Hammer	6¾@ 10
Concentrat'd, do	— @ 5¾	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4¼
COPPER.		**TINPLATE.**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 5 87½
Ingot, jobbing	— @ 14¾	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13¾	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @11 75
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot ₩ lb	— @ 23
Norway, base	— @ 4¾	**COAL.**	
PIG IRON.		**SPOT FROM YARD—PER TON.**	
	Spot.	Wellington	$8 00
Eglinton ₩ ton	22 00@—	Greta	7 50
Glengarnock	23 00@—	Nanaimo	6 50
Am. Soft, No. 1	24 00@—	Gilman	5 00
Oregon Pig	—@—	Seattle	6 00
Puget Sound	—@—	Coos Bay	5 50
Clay Lane White	24 00@—	Cannel	8 50
Langloan	22 00@—	Egg, hard	12 00
Thornecliffe	23 00@—	Cumberland, in sacks	15 50
Gartcherrie	22 00@—	Do, bulk	14 00
Barrow	22 00@—	Wallsend	7 25
Carnforfoot	22 00@—	Scotch Splint	7 50
CHROME IRON ORE.		Brymbo	7 50
Per ton	10 00 @—	West Hartley	7 50
LEAD.		**TO LOAD—PER TON.**	
Pig	— @ 4¾	Australian	5 00@—
Bar	— @ 5¼	Liverpool Steam	5 25@—
Sheet	— @ 7	Scotch Splint	6 25@—
Pipe	— @ 6¾	Oardiff	5 50@—
SHOT.		Lehigh Lump	15 00@—
Drop, sizes *smaller* than B, ₩ bag of 25 lbs	$1 85	Cumberland	13 00@—
Do do, B and *larger* sizes ₩ bag of 25 lbs	2 10	Egg, hard	11 00@—
Buck, Balls and Chilled do, ₩ bag of 25 lbs	2 10	West Hartley	7 00@—
QUICKSILVER.		**COKE.**	
Home trade, per flask	41 50 @42 00	English, to load	$8 00@ 9 00
For export	35 50 @36 00	Do, spot, in bulk	—@10 00
		Do, in sacks	—@12 00
		Cumberland	9 00@—

Eastern Metal Markets.

NEW YORK, Nov. 22.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38⅜	84⅜	11 80	3 75	20 15
Friday	38⅜	84⅜	11 85	3 75	20 25
Saturday	38⅜	84⅜	11 90	3 75	20 30
Monday	38⅜	84⅜	11 90	3 75	20 30
Tuesday	38 13-18	84⅜	11 90	3 75	20 25
Wednesday	...	...	.....	....	.....

Copper is strong with an advancing tendency. Lead is steady. Tin continues under manipulation influences. Pig iron is firm. Quicksilver is steady. Borax is in fair demand at unchanged quotations.

Mining Share Market.

SAN FRANCISCO, Nov. 23, 1892.

During the past six days mining shares have fluctuated downward. The decline has not been large, yet the weak and dragging character of the setback, backed as it was by strong bear points and strong bear press writing, created considerable and uncalled for demoralization. The wonder is, that under such a strong pressure the market did not go to pieces; that it did not must be accepted as proof positive that the inside has most too many of some of the shares for comfort and that the manipulators are not prepared to commit financial suicide by frightening the game to such an extent as to interfere, when the time arrives, with an attempt to unload at a fairly good profit. Whether the inside can succeed as well as they hope remains to be seen. The past few upmoves did not turn out as profitable to the manipulators as they, seemingly, had been led to expect, for when the market made a good advance more shares came in than they had evidently looked for, and as it took a good round sum of money to handle the shares of fully 20 mines, representing over 2,000,000 shares, the manipulators were forced to make a rapid retreat. The breaks in the market, unfortunately, carried in their wake the more credulous bull operators. While saying this, it must not be understood that the writer joins with those in decrying the mines and whose stock in trade is chiefly the cry of "if only a genuine development of ore can be made, then we will have a big boom in mining shares." The difficulty, and perhaps the only one, is that under the present system of milling ore on the Comstock, by which it is said mill rings get the bullion and the public the assessments, the money public cannot be induced to take part in the game, and until the latter operates we need not expect anything more than small boomlets, one of which all indications warrant the assertion that we are on the eve of having started, and that, while prices will go higher than now rule, operators must not look for anything big until the mines are managed and the ore milled so as to inspire confidence to invite moneyed outsiders to deal. At this writing the coming up move looks as if it will be another attempt to unload for assessment purposes.

The present showing in Belcher, if made at the time when the public had more confidence in mine-managers, would have caused high prices to obtain for the shares, which would have carried the entire line to a much higher plane of values. The present showing in that mine ought, on merit alone, cause the shares to sell for from $5 to $10 per share, and if present prospecting work results as favorable as experienced miners confidently expect, then the shares, on merit alone, would, if the mine was or is to be bonestly managed, sell for even more than $10 a share. This assertion is based on seemingly authentic information that the ore found on the 300-foot level, and which was followed for some distance, is from eight to twelve feet wide and averages over $40 a ton—some say over $50 a ton. If the west crosscut on the 400-foot level strikes the downward continuation of the ore, then the company has a large body of good-milling ore, which can be extracted at a small cost and dividends follow. But will it be done?

Mining shares opened this (Wednesday) morning moderately active at around the prices at which the market closed yesterday afternoon. After regular call, Belcher sold higher under a slightly improved demand, owing to advices that the ore pulped over $32 per ton. This high average, which was not generally looked for, should dispel the false reports of an assessment pending. The action of the market looks very much as if shares were selling at around bottom prices and that an advance along the line can be confidently looked for in the near future. Some of the more shrewd, conservative and heretofore successful operators look for one or more slight ups and downs, with, possibly, slightly lower prices before the market starts in on the coming boomlet; but that the latter is coming they affirm with unhesitating confidence, and this confidence appears to be well-grounded, for the public, it is said, has been squeezed out of every share possible, and when this fact is established beyond the cavil of a doubt, then the change for the better will set in.

Potosi ore the past week pulped $28.29, while the car sample assays went only $28.10 per ton. This is as it should be, and looks very much as if the managers of that mine were looking after the interest of *all* shareholders. It is to be hoped that the managers of other mines will follow in the footsteps of the Potosi managers, and see that the ore is properly milled and accounted for.

By those in position to know, it is said that the manipulators of the share market are not doing anything openly, but quietly have their brokers take in every share offered for sale, and not take any chances to lose any shares bought. Everything points to an upmove snon.

The shares in the Bodie mines, it is contended, are selling below their actual worth, which will be discovered before another year passes. In two or more of the mines, it is said by experienced miners, deposits of very rich ore are known to exist, and that the depression in these shares is probably due to this fact and a desire of the inside to buy all they possibly can and at as low a figure as possible.

From the Comstock mines our advices are of a very encouraging character. Along the entire line it looks as if important work is being done with the view to make a more general move from one end to the other. It is said that when work is too far advanced in one section dead work is done so as to let the more backward work elsewhere catch up. Work in the secret drift mentioned about three weeks ago is being vigorously pushed. The nature and character of the work is said to be known to a limited few. It is contended that in Hale & Norcross important work is held back until the word is received from John W. Mackey, through J. L. Flood. When this work is started, then more active work is to be commenced at interesting points in three other mines. In the Sierra Nevada-Union west crosscut they are nearing the west lode at about an equal distance between the old Burning Moscow and Sacramento. The west crosscut on the 1300-foot level of Seg. Belcher, unless stopped, bids fair to be one of the most important works under way. The news from New York and Silver Hill is

quite important, but owing to the low price of the shares, it is not attracting attention. The draining of the Ward shaft level of Alpha, Exchequer and adjoining mines through Potosi into the Sutro tunnel, is quite an important move. Who knows but the next move may not be reporting the rich ore found to the west on this level? In Yellow Jacket and Crown Point the work, it is said, will soon be quite important. In Ophir, it looks as if they are developing a kidney of rich ore. The changes in the character of the ore have been for the better. In Con. Virginia they expect to soon commence more active and important work.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco

NEWHALL HYDRAULIC MINING COMPANY (Los Angeles). Capital stock, $250,000. Directors—Edgar Moore, J. E. Lane, B. A. Holmes, J. A. Forthman and O. C. Smith.

EXCELSIOR CREAMERY CO. (Eel River Island, Humboldt Co.) Capital stock, $15,000. Directors — Smith Fulmor, Con. O'Mara, Silva Counsto, W. P. Thomas and C. F. Bunker.

PACIFIC MARINE RAILWAY AND WAYS Co. of San Francisco. Capital stock, $50,000, divided into 500 shares of the par value of $10 each. Directors—Alexander Hay, E. B. Wright, E. P. Schell, B. H. Madison, James Tayson and M. J. Madison.

THE OAKOLE MINING AND MILLING Co. Capital stock, $1,000,000. Directors—John W. Richards, Ed. H. Congdon, J. H. Congdon, Samuel W. Backus and Edward Kimball.

ALASKA FISHING AND TRADING Co Capital stock, $50,000. Directors—L. A. Rickoff, S. L. Weatherbee, S. W. Wetherbee, H. W. Snow and A. A. Hibbard.

EMME GROUND ELECTAIC GENERATOR Co. Capital stock, $1,000,000. Directors — Michael Emme, Geo. W. Peterson, Chas. P. Harris, Alphcus Bull and H. D. Hawks.

STOCKTON ELECTRIC LIGHT AND POWER Co. (Stockton). Capital stock, $250,000. Directors—H. J. Corcoran, E. R. Hedges, I. S. Bostwick, Joseph Fyfe and S. D. Woods.

PALO ALTO MUTUAL BUILDING AND LOAN ASSOCIATION (Palo Alto, Santa Clara Co.) Capital stock, $2,000,000. Directors—W. W. Sheldon, G. W. Mosher, W. E. Noris, D. L. Sloan, D. E. Ashby, H. G. Wilson, J. F. Parkinson, J. N. Morton and A. J. Harper.

PALOS GRANDE COAL AND TEANSPORTATION Co. Capital stock, $2,500,000. Directors—J. M. Martin, J. W. Pearson, L. M. King, G. E. Neale and J. F. Uhlhorn.

HAYES FISHING Co. Capital stock, $25,000. Directors—George Fogel, A. Rowes, D. E. Hayes, S. E. Weeks and J. J. Staiger.

PEERLESS POLISH COMPANY (Los Angeles). Capital stock, $100,000. Directors—C. S. Watson, W. E. Tyler, L. E. Tyler, M. S. Tyler and L. A. Watson.

FOGEL FISHING COMPANY. Capital stock, $25,000. Directors—George Fogel, Albert Rowe, D. E. Hayes, S. F. Weeks and John J. Steiger.

ROWE FISHING COMPANY (San Francisco). Capital stock, $25,000. Directors — Same as above.

STAIGEE FISHING COMPANY (San Francisco). Capital stock, $25,000. Directors — Same as above.

EL CAJON FRUIT COMPANY (El Cajon, San Diego county). Capital stock, $5000. Directors—George H. Holt, J. T. Gordon, R. C. Allen, G. M. Hawley, E. S. Vacher, S. J. Day and A. W. Gilbert.

FLAT CREEK MINING COMPANY. Capital stock, $400,000. Directors—Martin Jones, John Henderson, F. C. Mosebach. S. Gardner, T. E. Jewell and Sylvester Gardner.

BRISTOL MINING COMPANY (San Francisco). Capital stock, $400,000. Directors—Same as above.

BALAKLALA MINING COMPANY (San Francisco). Capital stock, $600,000. Directors—Same as above.

COSMOS GOLD-MINING COMPANY. Capital stock, $400,000. Directors—Same as above.

SOUTH IDAHO CONSOLIDATED MINING AND MILLING COMPANY (Glass Valley, Nevada county). Capital Stock, $160,000. Directors—W. J. Rogers, James McCerma, Joseph O'Keefe, W. H. Crase and J. J. Greany.

DR. WEEKS MEDICINE COMPANY (Oakdale, Stanislaus county). Capital stock, $25,000. Directors—E. L. Barkis, O. D. Weeks, C. H. Trelfal, Wm. P. Gsmble and A. F. Donaldson.

MONADNOCK GRAVEL-MINING COMPANY, limited (Marysville, Yuba county). Capital stock, $10,000. Directors—L. C. Williams, Wm. B. Bishop, Wm. F. Peacock, J. A. Maber and F. E. Smith.

COTTONWOOD CANYON WATER COMPANY (Pasadena, Los Angeles county). Capital stock, $30,000. Directors—W. S. Wrigbt, W. R. Staats, John McDonald, C. E. Brooks, Joseph M. Campbell.

THE W. A. DAVIS Co. (Brentwood, Contra Costa county). Capital stock, $100,000. Directors—William A. Davis, R. G. Dean, H. O. McCabe, J. R. Esker, P. G. King.

GREEN'S ART COMPANY. Capital stock, $10,000. Directors—Carl Cohn, S. Goldsmith, William Carter, Leo Green, E. W. Levy.

CALIFORNIA INVESTMENT COMPANY (Los Angeles). Capital stock, $125,000. Directors—George H. Bonebrake, F. C. Howes, W. Gillelen, W. S. McDonald, W. M. Sheldon.

LOS ANGELES THEATRICAL MECHANICS' ASSOCIATION. Directors—Henry Decker, L. E. Martin, J. D. Cochran, W. T. Waters, D. A. Stinert, B. Caspari, A. J. Snee, G. G. Hargnitt, James Taylor, Henry Stevens, J. R. Hilton.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 15, 1892.

486,076.—HOSE-SUPPORTER—Ellen A. Black Beckwith, Cal.

486,245. — WAGON-BRAKE — F. W. Dobbel, Purissima, Cal.

486,328.—RAILWAY SPIKE—S. Emrich, Redo, Nevada.

486,169.—CLAMP FOR STEREOTYPE PLATES—Wm. Filmer, S. F.

486 331.—GUN SWAB—G. H. Garrison, Sumas City, Wash.

486,250.—CASH CARRIER—A. B. Gunzendorfer, Monterey, Cal.

486,405 —DOUBLE PIANO STOOL—J. J. Hering, Seattle, Wash.

486,292.—LUBRICATOR—J. W. McCorkle, Lexington. Wasb.

486,232.—ORE CONCENTRATOR—P. de Napolis, S. F.

486,238.—SAFETY HARNESS—J. T. Smith, Oroville, Cal.

486,137.—TRAY FOR DRYING FRUIT—H. H. Taylor, Fresno, Cal.

The following brief list by telegraph, for Nov. 22, will appear more complete on receipt of mail advices:

California—Albert D. Coplin, Oakland, hose reel; Ferdinand Espel, San Francisco, measuring canister; William R. Hewitt, San Francisco, electric-releasing device; Andrew J. and J. James, Santa Cruz, lazy-tongs gate; Charles W. Metcalf, Santa Paula, centrifugal honey extractor; Roswell E. Morey, Oakland, machine for forming berry baskets; Edwin M. Ree e, Santa Paula, wooden vessel; James Tulloch. Los Angeles, concentrator; William A. Turner, San Francisco, street or station indicator.

Oregon—William S. Dillon, Portland, automatic station indicator; James Ecker, Portland, furnace.

Washington—John Globig, Spokane, car-coupling; John F. F. Kuhlmann, Seattle, railway system.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AXLE-NUT.—John Gambetta of Stockton, Cal. No. 485,497. Dated Nov. 1, 1892. This nut, which is intended for use on the threaded ends of the axle-spindles, to hold the wheels on, is so constructed interiorly that it can be adjusted to take up the wear in the hub-box and thus keep the wheel snug. It also securely confines the nut-washer, preventing it from falling ont when the nut is removed. The nut is provided with a lock, easily manipulated from the outside, which will hold it in place on the spindle at any point to which it may be set.

APPARATUS FOR BLEACHING FRUIT. — Elias Ireland, Winters, Yolo Co. No. 485,940. Dated Nov. 8, 1892. The object of the invention is to provide an apparatus for bleaching fruit, in the bleaching chamber of which an entire car or truckload may be introduced with readiness and deposited therein while the car or truck is removed, being adapted when returned to the chamber to receive the load again and withdraw it. The invention consists in a novel apparatus, composed of a chamber or casing to which the fumes of the sulphur have access, a vertically-movable track within said chamber and upon and by which a load-carrying truck is introduced therein, a removable load-platform carried by the truck, supports within the chamber upon which the platform is borne when relieved of the truck by the downward movement of the track, and a novel arrangement of levers whereby the track is vertically moved to cause the truck to be relieved of the load-platform and to receive it again.

WAGON-BRAKE.—F. W. Dobbel, Purissima, San Mateo Co. No. 486,245. Dated Nov. 15, 1892. The object of this invention is twofold—first, to provide such an arrangement and construction of the operating lever as will give on the backward throw thereof the greatest amount of movement in order to fully throw off the brakes from the wheels, and on the forward movement to give the greatest purchase or leverage for forcing the brakes to the wheels; and, second, to provide simple and effective means for holding the brake-block to the beam, giving great stability and means for tightening it up when loosened.

CASH-CARRIER.—A. B. Gunzendorfer, Monterey. No. 486,250. Dated Nov. 15, 1892. This is one of that class of cash-carriers in which the car is propelled from one end of the track to the other by means of a sudden force applied at either end. The object of the invention is to provide effective means for receiving and locking the car at the end of the line, releasing and immediately projecting it on its travels, regulating the power of the propelling device, adjusting the track to any suitable inclination and releasing the cashbox in its casing.

CLAMP FOR SECURING STEREOTYPE PLATES.—Wm. Filmer, S. F. No. 488,160. Dated Nov. 15, 1892. The invention relates to the class of devices for securing stereotype plates to their blocks, and particularly to those clamps which are detachable from and independent of the block and fit against the sides thereof when locked up in the chase. The present invention though adapted to any detachable or independent clamp which lies against the stereotype block or bed, is especially intended as a direct improvement on that clamp patented by the same inventor, Dec. 13, 1887, No. 374,667.

SAFETY HARNESS.—James T. Smith, Oroville. No. 486,238. Dated Nov. 15, 1892. The invention relates to that class of harness in which the traces are attached to the whiffletree by means of a trip-connection under the control of the driver, and the invention consists in certain constructions and combinations of devices. In case of a runaway, the driver can instantly release the traces, whereby the whole harness will slide forward free of the shafts and allow the horse to become disengaged.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 2		WEEK ENDING Nov. 9.		WEEK ENDING Nov 16.		WEEK ENDING Nov. 22.	
Alpha	.25	.30	.25	....	.25	.30	.25	.30
Alta	.20	.25	.20	.25	.20	.25	.25	.30
Andes	.40	.50	.40	.45	.45	.55	.45	.55
Belcher	2.20	2.65	1.55	.40	1.50	2.25	1.60	2.50
Belle Isle	.05	....	....	....	.05	....	.05	....
Bowers & Belcher	1.40	1.70	1.35	1.60	1.40	1.85	1.45*	1.85
Bullion	.40	.6	.30	.40	.35	.80	.50	*.85
Bodie Con	.25	....	....	....	.20	.25	.15	.25
Bulwer	....	....	.20	....	....	....	.20	....
Commonwealth	....	....	....	....	....	....	....	....
Con. Va. & Cal	2.85	3.05	2.75	2.90	2.80	3.15	2.55	3.25
Challenge	.55	.75	.50	.55	.50	.70	.55	.75
Chollar	.60	.80	.65	.70	.70	1.20	.75	1.35
Confidence	1.80	2.00	1.65	1.70	1.50	1.90	1.80	2.00
Con. Imperial	.05	....	....	....	.05	....	....	....
Caledonia	.15	.20	.20	....	.20	....	.20	.25
Crown Point	1.25	1.50	1.05	1.40	1.00	1.35	1.00	1.85
Cocker	....	....	....	....	....	....	....	....
Del Monte	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.10	.15	.10	....	.10	.20	.15	.20
Grand Prize	....	....	....	....	.65	....	....	....
Gould & Curry	.80	1.10	.90	.91	.85	1.10	.85	1.20
Hale & Norcross	1.30	1.50	1.20	1.40	1 30	1.50	1.45	2.10
Julia	....	....	.15	....	.10	....	.10	....
Justice	.10	....	.10	....	.05	*.30	.20	.30
Kentuck	.10	....	*.15	....	.20	.25	.20	....
Lady Wash	....	....	....	....	.10	....	.10	....
Mono	.25	....	.25	....	.25	.30	.25	....
Mexican	1.25	1.45	1.20	1.40	1.25	*1.8	1.60	1.90
Navajo	....	....	....	....	.05	....	....	....
North Belle Isle	....	....	....	....	....	....	.05	....
Nev. Queen	....	....	.05	....	....	....	.15	....
Occidental	.15	....	.10	....	.10	....	.10	.15
Ophir	2.40	2.85	2.45	2.75	2.60	2.9	2.55	3.20
Overman	.30	.50	.30	*.60	.60	.90	.60	.90
Potosi	.85	1.15	.85	.95	.95	2.25	1.40	2.45
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	....	....
Savage	.65	.85	.60	*1.25	1.15	1.65	1.25	1.80
S. B. & M	.30	.40	.25	.30	.25	.50	.30	.50
Sierra Nevada	1.10	1.35	1.10	1.30	1.05	1.40	1.15	1.60
Silver Hill	.10	....	.10	....	.05	.10	.10	....
Scorpion	....	....	....	....	....	....	.10	....
Union Con	1.10	1.30	1.00	1.10	1.05	1.4	1.15	1.55
Utah	.15	....	.10	.20	.15	....	.10	.20
Yellow Jacket	1.03	1.25	.85	1.10	.80	1.15	.85	1.15

*Assessment added.

California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast inventers far better service than they can obtain elsewhere. Send for free circulars of information. No 220 Market St., San Francisco Cal.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Belle Isle M Co, Nev	5	10c	Nov 7, Jan 4	Nov 5	J W Pew, 310 Pine
Bullion M Co., Nevada	49	25c	Oct 20, Nov 24, Dec 14		R R Grayson, 321 Pine
Carsa M & M Co			Sept 28, Nov 28, Dec 28		C C Coleman, 16 Fremont
Con Imperial M Co, Nevada	34	3c	Nov 22, Dec 29, Jan 19		C L McCoy, Mills Building
Cons New York M Co, Nevada	9	10c	Nov 2, Dec 5, Dec 28		C E Elliott, 309 Montgomery
Cons Pacific M Co, California	14	10c	Sept 29, Nov 5, Nov 30		F E Luty, 230 Pine
Cons St. Gothard M Co, California	6	5c	Oct 13, Nov 17, Dec 7		T Wetzel, 320 Sansome
El Leopoldo G & S M Co, Mexico	1	10c	Nov 11, Dec 14, Jan 2		Jabez Howes, 130 Sansome
Evening Star M Co, California	6	2c	Oct 10, Nov 12, Nov 29		J J Scoville, 320 Sansome
Exchequer M Co, Nevada	34	10c	Oct 28, Nov 30, Dec 26		C E Elliott 309 Montgomery
Golden Fleece Gravel M Co, California	18	83	Oct 10, Nov 16, Dec 7		W J Gleason, Phelan Block
Gould & Curry S M Co, Nevada	70	25c	Nov 22, Dec 28, Jan 20		A K Durbrow, 309 Montgomery
Indian Creek L & M Co, California	8	10c	Nov 4, Dec 14, Jan 6		S C Mills, Mills B'ld'g
Inyo Marble Co, California	18	50c	Sept 2, Oct 22, Dec 1		A F Thane, 137 Montgomery
Justice M Co, Nevada	54	10c	Oct 14, Nov 18, Dec 8		R E Kelley, 419 California
Kentuck Cons M Co, Nevada	5	10c	Oct 3, Nov 8, Nov 23		J W Pew, 310 Pine
Keyes S M Co, Nevada	5	25c	Nov 2, Dec 6 Dec 27		J H Sayre, 323 Montgomery
Lous & Lone G M Co, California	1	5c	Nov 5, Dec 14 Dec 30		J F Hotling, 113 Leidsdorff
Mexican M Co, Nevada	46	25c	Oct 13, Nov 17, Dec 7		C E Elliott, 309 Montgomery
Mono M Co, California	82	25c	Sept 15, Oct 24, Nov 14		H D Walker, 309 Montgomery
North Belle Isle M Co, Nevada	21	10c	Nov 14, Dec 20, Jan 17		J W Pew, 310 Pine
Occidental Cons M Co, Nevada	11	25c	Oct 25, Nov 30, Dec 21		A K Durbrow, 309 Montgomery
Overman M Co, Nevada	65	30c	Oct 5, Nov 10, Nov 30		G D Edwards, 414 California
Russell Reduction & M Co, California	8	1c	Nov 14, Dec 19, Jan 16		J Morizio, 33 Geary
Savage M Co, Nevada	73	10c	Oct 7, Nov 9, Nov 29		E B Holmes, 309 Montgomery
Sierra Nevada S M Co, Nev	103	25c	Nov 8, Dec 14, Jan 3		E L Parker, 309 Montgomery
South Eureka M Co, Cal	1	2c	Nov 2, Dec 9 Dec 31		A Halsey, 328 Montgomery
Teresa M Co, Mexico	9	10c	Oct 28, Nov 29, Dec 16		K J Williats, 307 Market
White Mountains M Co, California	2	1c	Oct 13, Nov 22, Dec 12		S K Nichols, 320 Sansome

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE.
Bulwer Cons M Co, California	5	L Osborne, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 310 Pine	Sept 19
Cons Cal & Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Nov 10
Standard Cons M Co., California	10	J W Pew, 310 Pine	July 26

NOTICE OF ASSESSMENT.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the 22d day of November 1892, an assessment (No. 70) of Twenty-five cents (25c) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room No 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the TWENTY-EIGHTH DAY OF DECEMBER, 1892, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 20th day of January, 1893, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Trustees.

ALFRED K. DURBROW, Secretary.

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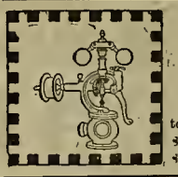

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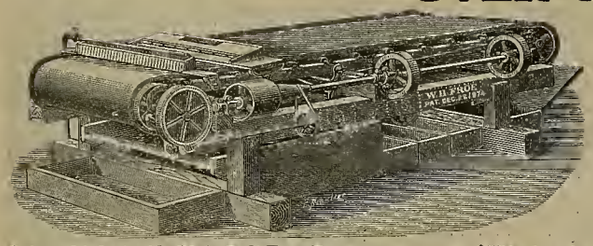

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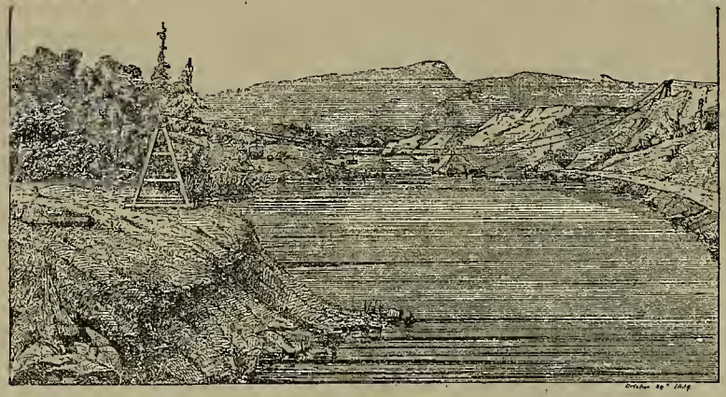

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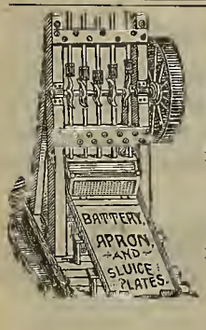

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An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL. LXV.—Number 23.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, DECEMBER 3, 1892.

Three Dollars per Annum
SINGLE COPIES, 10 CENTS.

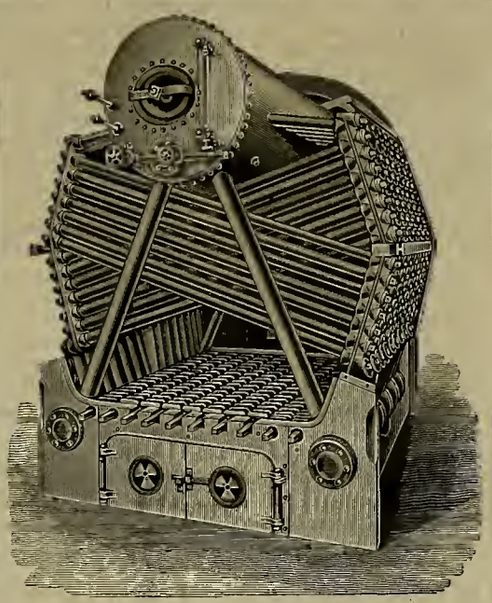
The Worthington Sectional Water-Tube Boiler.

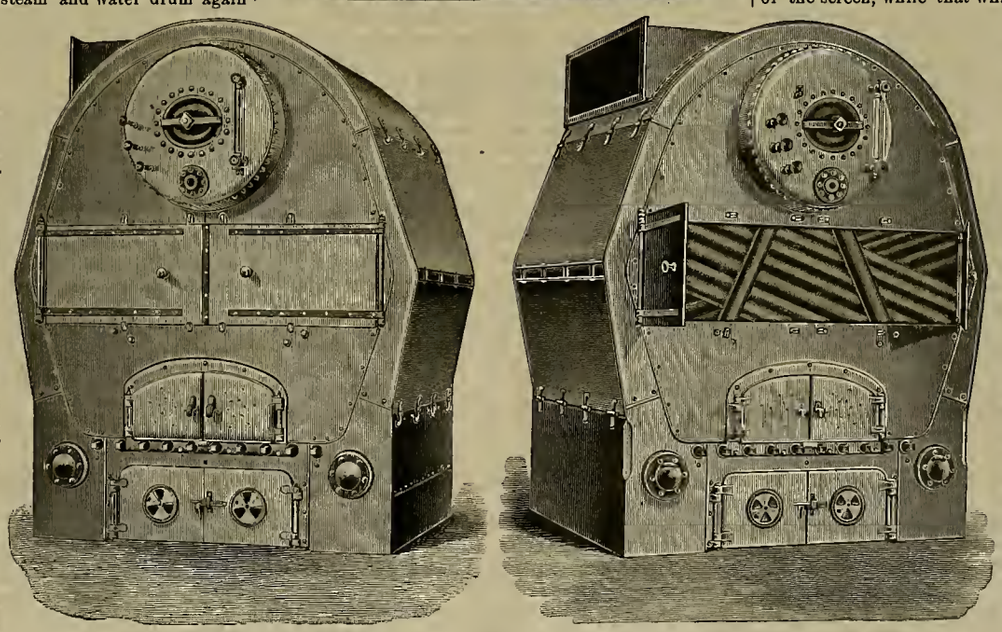
This boiler belongs to the sectional class, in which the water is contained in small tubes and chambers, designed to secure the requisites of safety, durability, accessibility and high evaporative efficiency. It is constructed of material of superior quality, and with a degree of mechanical excellence equal to that employed in the manufacture of first-class machinery; hence, very high pressure may be carried with safety and freedom from leakage. It is designed to be economical of valuable space, and at the same time to be of liberal proportions in grate area and heating surface. The interior of the entire construction is readily accessible from the outside for examination, cleaning or repair. The furnace extends under the entire boiler, and is of proper height to permit the use of any kind of fuel. As will be noted, upon reference to the cuts, the tubes are arranged in transversely inclined series of several tubes. Each tube is straight, and every tube end is expanded.

Every tube is wholly in the furnace, directly over the fire, and exposed to the full effect thereof; and every square inch is thus employed as active heating surface. The heating surfaces and water-ways are so arranged that the movement of the water contained in the boiler is constant and rapid. Its course is as follows: From the steam and water drum located above the tubes, into which water is fed, it descends the water legs—four in number—placed outside the furnace, to the water and mud drums at the base; thence it passes via the tube connections into the lower series of headers; thence through the tubes, over the fire, into the upper series of headers; thence via the tube connections into the steam and water drum again from whence it started. The proportion and combination of parts throughout the boiler is such that expansion and contraction, due to changing temperatures, can occur without straining or disturbing the position of any part or system of parts. The tubes being short, tubular expansion is reduced to a small fraction, as compared to that which is due to the employment of tubes of 16 to 20 feet long.

These boilers are proportioned and rated for generating power on the basis of the Centennial standard—namely, the evaporation of 30 pounds of water, at 70 pounds pressure, from temperature of 100°—to be one horsepower; said duty to be accomplished with a consumption of anthracite coal of good quality, at a rate of 12 pounds per hour per square foot of grate with good natural draft. It is to be understood that the actual steaming efficiency, and also the ultimate capacity, is largely in excess of the rating on above basis.

In a water-tube boiler the elements which insure safety are numerous. Primarily, in the strength of the parts which are combined; secondly, in the reduced areas exposed to rupture; thirdly, in the distribution of the total strain. It follows that a boiler composed chiefly of boiler-tubes, which, when of standard make and perfection, possess an enormous resisting power, as against explosion, is far advanced in the direction of safety in comparison with any type of boiler in which tubular area is a mere fraction of the total area subjected to explosive force. This boiler is very compact. A boiler of 200-horsepower can be passed through a 4′x4′ doorway, window, or sidewalk opening. A boiler of 100-horsepower occupies a floor-space 7½ feet square, and is less than 10 feet high. This boiler (Worthington patent) is manufactured by the New York Safety Steam-Power Co.





THE WORTHINGTON SECTIONAL WATER-TUBE BOILER.

THE Dardanelles drift mine of Forest Hill has made a contract with the Electrical Engineering Company, of San Francisco, for the introduction of an electrical plant for lighting, pumping and general power purposes.

A CHUTE of rich ore has been struck in the Yellow Diamond mine at Nevada City. Mr. A. F. Dunnington, Superintendent, is accordingly rejoiced.

Improvements in the Tulloch Concentrator.

James Tulloch, of Angels, Calaveras Co., has just patented several important improvements in the concentrator which bears his name. In this new machine the material to be concentrated is delivered in the form of a pulp upon the upper end of a screen mounted on the top of the frame and extending across the belt. The floor of this screen inclines in the same direction with the inclination of the belt, so that the material is delivered upon its upper end nearest to the discharge end of the belt, and is delivered off the screen at a point farthest from the discharge end of the belt. In this respect the arrangement differs from that of other feed apparatus which usually delivers in the direction in which the belt is traveling, and toward the discharge end instead of away from it. The floor of the screen is perforated with different-sized holes so as to form a mesh or screen opening which is finer near the upper end, and becomes coarser toward the discharge end. The inventor prefers to make the openings near the upper end of about the size known as fifty meshes to the inch. The intermediate portion of the surface may have the mesh of forty, and the lower end thirty to the inch. The pulp is delivered upon the table, and the very finest portion will pass through the upper end of the screen and fall upon that portion of the upwardly-traveling belt which is just beneath. This carries also the finest of the sulphurets and they are thus separated at once from the coarser material and are not subjected to the influence of the heavier material, which is more liable to carry them away. The next coarser material will fall through the middle portion of the screen, while that which is still coarser will fall through the lower part of the screen, and any which is too coarse to fall through the screen will pass over the lower edge. A separation is thus accomplished of the different grades upon the screen before they fall upon the belt, and they are delivered upon the belt in the order of their fineness, the finest uppermost and the coarsest at the lower end.

The operating mechanism of the concentrator is such that the proportion of the backward and forward strokes may be made to suit the condition of the material to be concentrated. It is so arranged that the forward stroke will be twice as much as the backward stroke, and the inventor therefore has an oscillating motion of the belt in the direction of its length, and at the same time the belt is gradually traveling upward to carry the concentrates over the upper drum or roller and deliver them at that end of the machine. By this means he is enabled to produce a more perfect concentration than heretofore.

There is also a new mechanism by which the belt is kept level transversely, and a novel clutch mechanism by which the belt is caused to advance gradually in the direction of its length during its oscillations. There are tubular flanges on the edges of the belt, with intervening longitudinal ribs and diagonal raised bars converging from the sides toward these central ribs, giving a tendency to draw the concentrations toward the center.

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San Francisco, December 3, 1892.

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BUSINESS ANNOUNCEMENTS.

[NEW THIS ISSUE.]

Pacific Hospital, Stockton.

Situation Wanted—Mrs. M. J. C.

Dividend Notice—Pacific Coast Borax Co.

☞ *See Advertising Columns.*

Comment.

There is in the vicinity of Redding, Shasta county. a large deposit of sandstone, some of which has been quarried. Tests of this stone show it will stand a pressure of about 5500 pounds to the cubic inch, which makes it good for building purposes. The stone has been used locally, but none has been shipped to this city on account of the freight rates. An effort has been made by the secretary of the Shasta County Miners' Association to get the railroad company to fix a rate which would admit of this stone being quarried and shipped. In this he has been successful. After giving the matter careful consideration, the railroad company has decided that if the people will open the quarries, and compete actively in the San Francisco market for sandstone, the desired rate will be given, viz., $2.50 per ton of 2000 pounds for rough stone in carload lots, cars to be loaded as near as practicable to marked capacity. On dressed stone the charge will be $3.30, subject to same conditions. The railroad officials say they would not care to inaugurate so low a rate as this, which is lower than anything they have heretofore quoted, unless there promised to be an active development of the quarries. It is probable that with this rate, this stone will now come to this city in quantities as soon as the quarries can be put in good shape for work.

With the rapidly increasing numbers of overhead or trolley-system electric railroads in this State, supervisors and councils should consider the necessity of enforcing some rule about guard-wires. As these are not necessary to the operation of a road, and entail additional expense on the company, they are not apt to be adopted except upon compulsion. There are in Oakland for instance, many miles of electric railread wire stretched, and not a single guard wire. Two horses were killed this week, and one man shocked by other wires bringing the current down within reach. East, in the cities, the roads all have guard wires to prevent falling telegraph or telephone wires coming in contact with the main trolley wire. Tbese conditions should be enforced here wherever the roads are started. There should be a general law to cover the matter, but while there is not, city councils and county supervisors granting franchises should make the use of guard-wires one of the conditions. It takes two guard-wires to each single trolley wire, and where, as is commonly the case, double track is used, and there are two trolley wires, four single or two double guard-wires must be used. This is lighter than the main wire but costs money, and thus far the electric railroad companies have succeeded in staving off any compulsory order for their use. It is time to call a halt, however, and compel the general use of guard wires for the safety of the public.

The whole State of California has received a pretty thorough soaking, the rains during the recent storm having been general. While the wind was of unusual violence, no extensive damage was done. In this city a few old and new buildings were blown down, and some damage was done to chimneys, fences, signs, etc. The railroad and telegraph companies will have some extra bills to pay on their lines; but in general the storm has been of great benefit. The streams and ditches on the mountains are now all full, and such mills and mines as have been shut down or running on part time for want of water, can now start up. In this State there are not very many places where the winter closes down mining operations, for even at the higher altitudes the well-equipped mines continue work. Of course in some sections the smaller operations cease, but the recent storm has started up as many mines as it has closed down.

The systematic manner in which the delegates to the International Monetary Conference are going into the silver problem gives rise to a feeling of confidence that some kind of concert of action will be arrived at which will point the way to rehabilitating the white metal. This feeling is strongly emphasized by the conference calling for the proposals of the American delegates (who are supposed to represent the bimetallic side of the question) and following up the same by having the English delegates, through Baron Rothschild, submit theirs. In securing the proposed plans of the two extremes and submitting them, together with proposals of delegates from other countries, to a committee, the rough points can be rounded and a general plan adopted which will meet the approval of all nations interested. The American delegates' proposal embraced that of Moritz Levy and also that of Dr. Soetber (both noticed at length in the commercial department of this paper on Oct. 15) and another proposition of their own formulation. Dr. Soetber's plan had been previously submitted to both the German and French delegates, and by them was received with favor. But the plau which attracted the greatest degree of interest, and toward which financial eyes are focused, is that proposed by Baron Rothschild on behalf of the English delegates. His proposals are that America continue the purchase of silver and the Euopean powers buy an amount equal to £5,000,000 a year for five years at 43d. If silver should rise above that price the purchases are to be immediately suspended. It is expected the proposals will be referred to a committee. It is stated that Rothscbild proposes to raise the legal tender of silver in England from £2 to £5. Great importance attaches to the proposal, as it means the English £5 would be payable in silver. The Rothschilds' proposal was referred to a special commission of fourteen delegates. The same commission was instructed to consider and report on the plans of Moritz Levy and Adolph Soetber, mentioned in the proposals of the United States delegates. The commission on the American proposals will sit daily and will report to the conference.

Obtaining Title to Mineral Ground.

Many miners in this State are encountering serious difficulties in the way of securing patent, or of demonstrating their rights to claims which are plainly mineral in character and to which they should unquestionably be entitled. This is due to several causes: First, the claim may be upon an odd section listed to the railroad company. Some one has either ignorantly or fraudulently attested to its nonmineral character, and the application for patent is rejected in the Land Office. To be sure, the railroad company's title may be purchased for what it is worth, but it is by no means satisfactory. It is subject to attack, and can in no case carry with it extra-lateral right, or the rigbt to follow a vein on its dip into neighboring ground.

Second, the Commissioner of the Land Office may refuse to pass on application for patent, holding arbitrarily that the mineral character is not shown, and prescribing an impracticable method of proof.

Third, we have no satisfactory law to govern "annual assessment work." It is difficult to prove that work has *not* been doue by a fraudulent adverse claimaut. An old abandoned claim may be relocated and worked in good faith, with the moral conviction of sole right, yet title cannot be guaranteed, as the old claimant may come in at any time and maintain by false oath that he did the annual work from year to year, and it is difficult, often impossible, to prove the contrary. This is a more important point than it may seem, but has given the drift miners, for instance, considerable trouble. There should be some means of proof of labor outside the individual claiming to have performed said labor. That is, there should be some compulsory record and a properly authorized official to see that the labor has been actually performed before such record is made. In default of such official proof and record the subsequent claimant would be more sure of his ground.

The alleged owner of an old, loosely described and improperly marked claim may float his boundaries onto the discovery of a valid claimant, and prove them by false testimony.

Thus it too frequently happens that a valid claimant cannot prove his right, and is thwarted in his effort to secure capital to open his mine. These difficulties can doubtless be remedied, or at least greatly reduced, by the enactment of suitable laws.

Regarding railroad title to mineral land, it is not presumed that further congressional enactment may be had. The questions involved doubtless belong in the courts.

Concerning the difficulty of proving "mineral character," however, we should be able to obtain more direct relief. There is an urgent need for a uniformly just and simple criterion. The present practice of the Land Office is irregular and at times decidedly unsatisfactory.

We should be able to obtain through Congress some definition or some provision for determining the "mineral character"; something definite to govern the rights of claimants and the practice of the Land Office.

The "annual assessment work" is not an easy matter to govern. Tbere is at present a State law requiring the recording of proof of the annual work, but it does not seem to be the uniform custom to comply with this requirement. It is, moreover, held by some that Congress alone can enforce such a requirement, and that the State has no jurisdiction. Furthermore, it is a matter of very little risk for a dishonest claimant to swear to $100 worth of labor when not one-tenth of that amount has been performed. It is a difficult matter to disprove his statement. It ought not to be left to the claimant to determine whether or not he has complied with the law. Perjury should not receive unnecessary encouragement. The annual assessment work is generally wasted on an undeveloped property. Especially is this true in the case of drift mines, where such work too often consists in shallow pits sunk in the barren surface material, and has no important bearing whatsoever on the development of the mine.

A free discussion of these questions is desirable, since suggestions from intelligent men of mining experience might lead to a remedy. The Committee on Legislation of the State Miners Association has the whole matter under advisement, and invites suggestions from those who feel sufficiently interested to send in their views in writing. As a basis for discussion this Committee has formulated a proposed Act of Congress which would cover the ground broadly. After further deliberation the Committee proposes to prepare a section to be iuserted as an amendment to the U. S. Mining Laws, and urge upon our Congressional delegation the desirability of its passage by Congress. The proposed section as at present drawn is as follows:

An Act Concerning the Entry and Patent of Public Lands—Mineral in Character.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, that no lands shall be subject to entry and patent except as mineral lands, which lands are situated in any locality known to be valuable for deposits of gold, silver, cinnabar, lead, tin or copper, unless it shall be clearly established that such lands do not contain in paying quantities deposits of either gold, silver, cinnabar, lead, tin or copper.

The MINING AND SCIENTIFIC PRESS will devote reasonable space in its columns to a discussion of this subject, and correspondence is therefore invited. What is mainly wanted is some suggestions for a practical remedy. Doubtless many of the mining counties of the State, that have experienced difficulty under the present conditions, have some ideas which would help tbe matter out. The State Miners Association, through its Legislative Committee and Executive Committee can bring the subject to the attention of lawyers, when a suitable Act, covering the points, is formulated.

World's Fair Mineral Exhibit.

A resolution was adopted at the recent mining convention that a committee be appointed to see that the mining counties make a full and representative exhibit. In accordance with this resolution, President Neff has selected the following a committee on the World's Fair mineral exhibit: Dr. Wm. G. Hodson, chairman; S. B. Call, Amador and El Dorado; Andrew G. Myers, Siskiyou; John McMurray, Trinity; E. B. Price, Lassen and Butte; Chas. F. Hoffman, Placer; August C. Busch, Sierra; Alf. Tregidgo, Nevada; Chas. Bogan, Mariposa; David Oliver, Tuolumne; A. F. Bryant, Mono; Jas. O'Brien, Yuba; Chas. H. Hendle, Plumas; John F. Davis, Calaveras; Henry Martin, Chas. G. Yale, N. J. Brittan, San Francisco. Dr. Wm. G. Hodson (Shasta county) was chosen as chairman, as his system of collecting and classifying ores and economic minerals had proved practical and satisfactory. A description of this system and other essential information has been issued by Dr. Hodson for the State Commission. Copies can be had from members of the committee, and a number have been placed in tbe office of the MINING AND SCIENTIFIC PRESS, where they may he obtained on application.

Coast Industrial Notes.

ONE-THIRD of the town of Jerome, where the works of he United Verde Copper Company are located, was destroyed by fire last week.

A PROMINENT Omaha firm has sent an inquiry to several Tacoma and Seattle firms for 500 carloads of cedar shingles for spring delivery.

ON the Miner Ranch, near Lafayette, Contra Costa Co., they are boring for oil, with favorable indications. Oil has been found in the 200-foot well, but as yet not in sufficient quantity to pay.

CONTRACTS for the new passenger and freight depot at Baden were let last week, and the work is now well under way. All the material for the structure has been delivered. The new depot, which is about 120 feet long, will answer the purpose until the completion of the new bayshore line, when a much finer structure will be erected.

A COMPANY has been organized in Los Angeles for the manufacture of glass and has applied to the City Council for a lease of land alongside the river. Besides river sand, from which ordinary glass for bottles, fruit jars, etc., can be made, the company has secured control of several deposits of fine sand in this neighborhood, from which glass of high grade can be made.

THE City Council of Ogden and the county of Weber have appropriated $40,000 as a bonus to induce the Southern Pacific to remove its shops from Carlin, Nev., and Terrace, U. T., to Ogden. A contract has been signed by all the parties and the removal takes place at once. The railroad company agrees to employ at least 300 men in the shops and to enlarge the plant as the business requires.

A DISPATCH from Phœnix, A. T., says: Articles of incorporation have been filed by the stockholders of the Phœnix, Mount Olive and Mesa Railroad Company. The capital is $1,500,000, and it has already been raised. The incorporators are local and Massachusetts men. The proposed line is to be twenty-five miles in length and will take in all the principal towns in the valley. The work of construction will begin immediately.

THE officials of the Sunset Telephone Company made public the fact that a line connecting Fresno with San Francisco may be be built. The intention is to run the wire by way of Hollister, through Panoche or Pacheco Pass. From Hollister the line will pass through Gilroy. The exact route has not yet been decided upon, and will not be until Mr. Gray makes his report. The work of construction will commence soon after the route is decided upon.

SPRUCE (or Washington pine, as it is sometimes called) will in the near future become one of our most valuable woods. Some day the clearings in the forest will be full of woodenware factories. Spruce is especially valuable to the manufacturers of tubs and pails, because it does not communicate taste or odor of the wood to the contents. This fact is especially pleasing to butter makers, as butter very easily absorbs the flavor and odor of the utensils in which it is packed. The same is true of nearly every article of food packed in tubs, pails and boxes.

JAMES G. FAIR and George Whittell applied to the Supervisors for a franchise for an electric road on Van Ness avenue in this city, and there was such a very vigorous protest and opposition all along the line from the property-holders that the application was withdrawn. Already, between Market and Filbert streets, Van Ness avenue is crossed by fifteen lines of cars, the first of which is the Oak-street line, crossing the wide avenue on Fell street, and the last the Union-street cars, and these fifteen lines afford all necessary means of transportation. Senator Fair wanted to tap his numerous blocks of land on the bay shore, at the foot of Van Ness avenue.

EDSON F. ADAMS has recorded a contract with Darby, Laydon & Co. to construct a bulkhead along the northerly harbor line of Oakland harbor from the easterly line of Alice street, extended southerly to the eastern line of Fallon street, extended southerly in accordance with plans and specifications prepared by L. J. LeConte, civil engineer. The specifications show that piling is to be driven to the water line and backed with filling to form a wharf along the entire frontage of the bulkhead. This wharf will be 1600 feet long. The marsh back of it is to be filled in to city grade, and on this warehouses, etc., are to be erected. The lumber for the work is all on the ground, and the pile-drivers have commenced operations.

FOLLOWING is the salmon pack of the canneries up the coast to date: Gardiner Packing Co., Umpqua, 14,000 cases; Florence Packing Co., Siuslaw, 5000 cases; C. Timmins Packing Co., Siuslaw, 11,500 cases; Alsea Packing Co.. Alsea, 4000 cases; Elmore Packing Co., Tillamook, 18,000 cases; Nehalem Packing Co., Nehalem, 10,200 cases; P. J. McGowan & Sons, Wilpa Harbor, 14,500 cases; United Canneries, Gray's Harbor, 17,000 cases. This makes a total of 93,700 cases. The Columbia river fall pack will amount to about 12,000 cases, making, with the foregoing, an aggregate of 105,700 cases. Allowing for estimates and discrepancies, the fall pack may be deemed, in round numbers. 100,000 cases. The quality of the salmon has been unusually good this season. Most of the fall pack has all been placed and is practically out of first hands.

THE State jute mill at San Quentin was established about ten years ago with a plant of 100 looms and a capacity of 2,500,000 bags annually. Six years ago the Legislature appropriated $160,000 for machinery to double the capacity of the San Quentin mill. The prison authorities are now putting in the plant, and by another year the capacity will be 5,000,000 bags. Several attempts have been made to introduce the manufacture of grain bags at Folsom prison, but some objections were made, mainly on questions of local conditions. The principal of these are the dryness of the atmosphere, which causes a shrinkage in the jute, and renders it brittle and liable to break. Folsom being on the line of a railroad, the freight charges on the product, water transportation not being available, would be very large, and would increase the cost to the farmer.

IN the last monthly bulletin of the General Electric Company is found this list of electric roads, built or contracted for in Oakland, with the mileage of track and number of cars:

Lines.	No. Miles.	No. Cars.
Highland Park and Fruitvale	6½	6
Oakland Consolidated Street Railway Co..	15	30
Oakland, San Leandro and Haywards	16	25
Consolidated Piedmont Cable Co	10	10
Oakland Railway Co	16	32
East Oakland Street Railway Co	6	6
Total	69½	109

The Alameda Company has nearly completed five and a half miles of track, and when it shall have built all the line it has franchises for, it will have ten miles of track and will run 14 cars. This will make a total of 79½ miles and 123 cars. This does not include about 4½ miles of double track, or 9 miles of single track, of the Piedmont cable road. It is a fine showing, and one which no other city on the coast, unless it be Los Angeles, can equal. This has all been done in two years. The most recently completed of these electric roads, the East Oakland street railroad, is now running regularly. The tracks and wires of the Telegraph avenue line are ready, but the road will not be operated for another month. This will be a first-class road.

IT is proposed to establish cordage or rope works at the State Prison at Folsom, when the water power from the American river will be utilized. The cordage of the United States is practically under one immense trust, the National Cordage Association. This trust makes no shipments to this coast, the business here being controlled by the Tubbs Cordage Company, which has a fully paid up capital of $1,000,000. This company fixes prices on this coast, and holds the market absolutely. The National trust is so powerful that no private corporation could possibly compete with it. The only possible competition is the State, with its free labor and free water power: It will remain with the legislature to make an appropriation for the machinery and plant, and the labor of the prisoners can be utilized.

FROM the statement made by one of the surveyors connected with the San Francisco and Great Salt Lake Railroad, that concern intends to commence active operations about the first of the year. The branch line between Fruitvale and Stockton has been surveyed, and the new line will be shorter by twenty miles than by the present line. On the first of the month the field surveyors completed their work to Reno, Nev. The route is outlined to commence at Bay Point. It will then run to Suisun bay, which it will cross at Benicia. The survey then skirts the Sacramento river to the capital city. Marysville and Oroville will be the next points touched at. The route then runs up the canyon of the North Fork of the Feather river. At the end of this it will run over the Sierras and thence to Reno, Nev. The Stockton branch has been surveyed over the Moraga rancho, and will enter through a tunnel about two miles above Mills' Seminary. The surveying party has been ordered to report for duty on the 2d of January.

THE Santa Margarita gap will be closed before next winter, and through trains will then be running to the East through San Jose. The work of tunneling through the mountain, is being vigorously pushed by McMurtrie & Stone, the contractors. The rock which is being tunneled is very hard and is black in color. It has the appearance of coal. Beginning at what is known as the Cuesta grade a large number of men is engaged in blasting rock away from the mountain side. There are three shifts of men working on the tunnel day and night. They have eight-hour shifts. The tunnel will be 1400 feet long and will bear the name of Borondo tunnel. The men are already under ground on the Santa Margarita side and the tunnel now reaches sixty feet under ground. The money for the work will not be paid until the tunnel is completed. At present the work is a little slow, as the ledge of the hard rock has been encountered, but as soon as this is passed the contractors think they will reach sandstone, and then the work will be easier. A track has been laid to the tunnel, and as soon as the rock is blasted it is piled in the gravel cars and carted off. As the work progresses the tunnel will be boarded up with 12x12 scantling, five inches apart. Work on the San Luis Obispo side has already commenced and is being rapidly pushed. All culverts on the line of the new road are made of sandstone and cement, and the roadbed will be the best in the State. The tunnel will probably be completed in six or eight months.

THE application of the San Francisco and West Shore Improvement Company for a railway franchise on Twenty-fifth street, Potrero avenue and other thoroughfares was defeated at the meeting of the Board of Supervisors, not receiving the necessary majority vote of all the members. The application of Messrs. Sherwood, Goodall, Burns, Reed and others for a franchise to construct a railroad in the northern part of the city, along First avenue, Fulton, Scott, Fell, Webster and other streets, was defeated. An order was passed to print granting the City Railroad Company the right to extend its tracks, commencing at the intersection of Silver avenue with Mission street, along Mission street and the new county road to the county line; also commencing at the intersection of Mission street and Richland avenue, along the latter avenue and along Andover avenue, East Park street, Holly Park avenue, West Park street and Holly street from Mission street to Richland avenue; also commencing at the intersection of Mission street and Cortland avenue, along Cortland avenue, Butler street, Blaine street, North avenue, California avenue, Powell avenue; also from Mission street along Twenty-ninth to Noe. An order granting to the Presidio and Ferries Railroad Company a franchise over Baker street from Jefferson and on Greenwich from Baker to Franklin was passed to print. A petition was filed by Joseph G. Wall and John Harper for a railway franchise from the intersection of East and Commercial streets along Commercial, Davis and Pine to Central avenue; commencing at the intersection of Devisadero street with the waters of the bay, then southerly on Devisadero to Grove street; commencing at the intersection of Pine and Laguna to Market, across Market, along Guerrero, to Fourteenth, to Dolores, to Nineteenth; from Noe along Twenty-sixth to Potrero avenue; from Devisadero along Grove to Stanyan; from Devisadero along Eddy to Mason, to Market; from Devisadero along Washington, First avenue, Lake street, Eighth avenue, C street to the Ocean boulevard; commencing at the intersection of Eighth avenue and C street, along Eighth avenue to the park.

MRS. HARRIET W. R. STRONG has made quite a financial success raising pampas plumes on her ranch in Whittier, Los Angeles county. Here she has a place of 220 acres, of which 150 acres are set out in walnut trees. Between the rows of these the pampas plumes are grown. Before Mrs. Strong went into the business the plumes which were sold throughout the world came from South America, and while people admired their graceful beauty they were very unsatisfactory for ornamental purposes, owing to the fact that the feathery plumage soon dropped off. It was not until Mrs. Strong began raising them on a large scale that a successful effort was made to find some means of obviating this. To Mrs. Joseph Sexton of Santa Barbara is due the credit of first discovering the curing and preserving process which is now in successful use. As it is now, when the plumes leave Mrs. Strong's curing establishment they have been so treated that they may be handled, practically without danger or injury. From the very beginning of her operations Mrs. Strong has been very successful in finding a market for her wares in Europe, and the special object of her efforts just at present is to increase the American demand. In this she is meeting with encouraging success. Last year Mrs. Strong raised 2,000,000 plumes, the crop during the present season being 1,750,000. Of these 100,000 were sold in this country for use during the campaign, and 650,000 were disposed of in Europe. The remaining 1,000,000 were reserved for use at the World's Fair, 10,000 being needed for the interior decoration of the California building alone.

Personal.

W. J ROE, an old timer of Bristol, Nev., has gone to Kingman, Arizona, to settle.

JAMES W. MICHAEL is running a leaching plant at the White Hills, A. T.. and seems to be making a success.

FREETHY and Tallon, the Mountain View team, won the championship in the drilling tournament at Butte, Montana.

JAMES L. FLOOD and Nat Messer have returned from the East. They report that John Mackay will not be back on this coast for two months.

J. C. MACKENZIE, of Creede, Colorado, has gone down to Kingman, A. T. He is interested with John Burnett in mines in Gold Basin and also in White Hills.

JONATHAN JEWELL, who used to mine in this State and Nevada in early times, was run over by a train and killed at Great Falls, Mont., last week. He was 92 years of age.

JOHN MARSHALL and Parker Holloway have sent in a small lot of the richest ore ever shipped from White Hills. The sample assayed nearly 2700 ounces silver and a few ounces in gold.

ANOTHER change has been made in the superintendency of the Oakland Consolidated Street Railway Company. David Rutherford has retired from the position, and he will be succeeded by J. Simms.

MAJOR J. W. POWELL, Director of the U. S. Geological Survey, who has been in California for a couple of months, has left for Washington, going first to Oregon and thence East by the Northern Pacific.

CAPTAIN GEO. A. NIHELL has returned to Nevada City from Forbestown, having completed his contract at the Gold Bank mine. It is said that Captain Nihell has been appointed agent for the estate of the late D. R. McKilican, and will take charge of the affairs at North Bloomfield.

F. FORMHALL, mining engineer, has been in charge of the survey of the outlet of Clear Lake for the purpose of utilizing the waters of Cache creek for electric motor purposes. The scheme proposes to take the water from the creek or lake and conduct it a distance of about six miles in iron pipes, where it is to be utilized for the purposes mentioned.

W. H. SMITH, general manager of the Star mine, near Hailey, made his first visit to Ketchum last week. Mr. Smith's mission was to examine some valuable mining property. "Hank" Smith, as he is familiarly called, is a thorough mining man and is well known all over the Pacific Coast, he having managed some of the large mining enterprises in Nevada, Utah, Arizona and Mexico.

CAPTAIN B. J. REILLY, Jim Smith and Harry Fleichman, three well-known and experienced miners of Tuscarora, outfitted at Elko last week and departed on a prospecting trip to the Colorado river. They had a light, covered wagon drawn by two horses and a saddle horse. Their route will be by the way of Fort Halleck, Butte Valley, Hiko, Mountain Meadows, and south into San Bernardino county, California.

CIVIL ENGINEER OTTO VON GELDERN, who has been making an official survey of the Yuba and Feather rivers for the purpose of ascertaining the most feasible location for the proposed change or cut-off in the channel of the Yuba river, has about completed his work and will soon file his report and recommendations with his superior officers. He has been making the survey under the direction and in behalf of U. S. Engineer W. H. Heur, of this city.

Quartz Mines of Placer County.

By Our Traveling Correspondent.

AUBURN, Nov. 21, 1892.

TO THE EDITOR:—Quartz has never assumed pre-eminence in Placer county mining; neither has it been insignificant. It has remained in great part undeveloped. In the divide region, it is well-known that there are many rich, unexplored metalliferous veins, yet, with two notable exceptions, that whole country is given over to gravel enterprises. The Ophir district, two miles west of Newcastle and four miles south of Auburn, is the only locality that is noted for quartz; and with 80 or 90 claims and a half-dozen or more mills, it has scarcely one property that has worked with the continuity of a generally-considered successful camp or mine. Rich finds from time to time have created temporary and small-sized booms, never anything of a dangerous form though; but there has been a lack of a number of things, which, if possessing them, would have made this a great mining camp long ere now. Rebellious ores and litigation have caused the mines, that would otherwise be the best, to shut down. Many of the mines that have proved the richest are in what is known as specimen ledges, in contradistinction to continuous milling ledges.

There are good mines in the district, and some are now being reopened or opening for the first time. Their development is likely to be prosecuted on a more systematic and business-like plan than in the past, and there is no legitimate reason why some of the best mines in the county should not rise here.

THE GOLD BLOSSOM AND THE CYANIDE PROCESS.—Mr. C. F. Reed of Auburn is owner and superintendent. The property has a ten-stamp mill and a reverberatory furnace. Owing to the presence of antimony and arsenic in the ore, it has been impossible to extract more than 30 per cent of the free gold. Thus, ore of an assay value of $20 would mill but about $6. Still, the sulphurets are very rich, giving average returns of $330 per ton of concentrates, saving 2½ per cent. In order, if possible, to work this rebellious ore to advantage, Mr. Reed, some time ago, dispatched a man to Denver to make a thorough study of the MacArthur-Forrest process with a view to introducing it at the Gold Blossom. Samples were taken, and in the laboratory the most satisfactory results were obtained. After an extended study, the agent returned enthusiastic. Tanks and the necessary plant were constructed to treat the ore on a large scale. But here, as seems to have been the case in many other instances where it has been endeavored to introduce the cyanide process on a practical working scale, it has proved a signal failure. Mr. Reed cannot be accused of having come hastily to his conclusions, as it was as much to his interest to succeed as to any one's. A faithful and conscientious trial of over three months with continued experiments failed to bring about results approaching anywhere near satisfaction. The Denver Co. sent a special agent out and he pronounced it unsatisfactory, and could offer no improvement. The company wanted to buy the mine when the process was first being introduced, but when the result of the trial became known, they went back on their offer. The trouble with the process at the Gold Blossom was in getting the gold *out* of solution and free from the zinc. For the past two months the mine and mill have been shut down, and will not be reopened till some satisfactory way of working these ores is found.

THE ST. LAWRENCE AND THE CRAWFORD MILLS.—The St. Lawrence has lately started up, with considerable promise of success. Whether it meets the full expectations of its promoters, and of all interested in legitimate mining, or not, the progress of work here will be followed with much interest, as this mine is introducing the Crawford mills as a permanent plant. The mills have been put in here by the superintendent, Mr. J. R. Richardson, who has had considerable experience with them on ores from all over the world, particularly those of Australia and South Africa. The Crawford mill is one more addition to the list of the centrifugal type, and those who have seen it in operation pronounce favorably upon it. Its principle is much that of the ball-bearings of a bicycle. A disc revolves close to the bottom of a pan and so fitted as to cause nine heavy balls to roll continually in a circular-grooved space of the disc and the sides of the pan. The edges of the disc and the sides of the pan all but touch, leaving a small space through which only the gold and the sulphurets find their way. The bottom of the pan is covered with quicksilver through which, from below, is a continual flow of water, carrying back all mud, sand and other gangue material. The mill is nearly spherical in shape and the waste makes its escape from the top. Screens are entirely unnecessary, as nothing can pass off except by being carried upward in suspension and flow away as finest silt. For this mill it is claimed that it saves 50 per cent of the losses of all other mills; it is the most perfect amalgamator, saving free gold and sulphurets alike. There is no use for screens, plates or riffles, for everything is caught in the mill and drawn off when desired. There is nothing complex about the mill, very little noise, small power necessary, and the mill itself is as compact as a teapot.

There are two 5-foot mills at the mine, with a capacity of from 5 to 10 tons each per 24 hours. The two crush now 10 tons in that period, though that amount could be doubled. When I visited the mine they had been in operation about three weeks and were giving perfect satisfaction, and seemed to be working up to their full claims. The sulphurets, in cleanness, are not distinguishable from those taken from any of the concentrator belts ordinarily in use. They are not ground to powder either, it only being necessary for the granules to be of sufficient size, from ⅛ to ¼ of an inch, to pass to the bottom of the pan.

One of these mills could probably do the work of a 5-stamp battery on moderate rock. I do not believe it would be applicable in gravel-crushing, as here large capacity is a main thing and fine pulverization less necessary, and the natural preverseness of gravel silt to cement would clog the mill. But for quartz and rock of medium or high grade it should do finely, and for its compactness, comparatively small original cost, and cheapness of maintenance should commend itself to the miners.

The mill is the invention of an American, controlled by English patent. The American rights are held in New York by a company of which Erastus Wyman is the head. Some of the mills are now in use in Colorado, Utah, Montana, Canada, Mexico and British Honduras. Mr. Richardson placed one of these mills last year in the Three Star mine in the Ophir district, about two miles west of the St. Lawrence. While working it proved very satisfactory, but the mine is now closed down. A Crawford is soon to be put in the Allen and Waldeck mine in Nevada county.

The St. Lawrence is generally reputed to be owned and operated by an English company, but is really owned in New York. The mine is opened by a 600-foot tunnel on the ledge, giving 300 feet of backs. A shaft is now sinking on the ledge to connect with the tunnel, and is down 65 feet. The ledge averages two feet in granite formation, with a four-foot seam of syenite on the footwall.

THE MINA RICA.—J. W. McCullough of Auburn, is owner and superintendent. The 10-stamp mill does some occasional custom work. The mine itself has proven very rich at times and in places. It may start again this winter.

THE HATHAWAY MILL of 20 stamps, owned by Valentine Bros. of S. F., has lain idle for three years. Mr. S. Hammill, who is in charge as superintendent, has kept the mine well-timbered and opened, so it is ready to start at any time, which it is likely to do. The mine is opened by a shaft 400 feet, but is not stoped below the 300 level.

The Eclipse 10-stamp mill has lain idle for some time on account of litigating heirs.

There are a number of small mines working on a small prospect plan and that appearances favor.

THE MORNING STAR, or Walters mine, owned by Otto Walters of Ophir, adjacent to the Eclipse, is leased to Holcomb & Miller. From a 45-foot level, 75 feet in, 29 tons of ore crushed in October at the Mina Rica mill yielded $4816, or $166 a ton. The ore, while showing well, does not, of course, all prove so remarkable. The ledge varies from one to three feet.

THE OLD HOPE has yielded some very rich rock in the past. Johnson & Hawkins are prospecting it on a small scale. The rock carries a considerable proportion of silver, generally in larger part than gold.

THE MOORE is owned by Messrs. Thorpe & White. It has a small steam hoist and works its rock by custom. From a 300-foot shaft about $40,000 were taken out in the past three years. This chute of ore being exhausted, a tunnel has been run 100 feet on the ledge, with hopes of striking the chute above, and within a few days, I understand, a very rich body of ore has been met.

THE GOLDEN STAG is being worked by W. R. Monahan. It is a west continuation of the Thorpe ledge. It has a small horse-whim hoist and the shaft is down 90 feet, showing a 15-inch ledge of good prospect, of high grade, and improving with depth.

It is stated that Messrs. Doane and Bryan of the Conrad contemplate milling at the Mina Rica and introducing the cyanide process.

WHITE BROS. are said to be taking good rock from a small mine they have operated for some time. They have a small hoist. Dr. Schnabel, of Newcastle, contemplates putting a mill on his Bowlder property.

THE RISING SUN MINE, a mile west of Colfax, continues idle on account of litigation.

In the Divide region are the Pioneer and Drummond, which for a long time have been the only really operating and paying mines of this character in the county.

THE DRUMMOND.—Hon. C. F. Reed, of Auburn, is owner, and J. L. Grimes superintendent. The mine is situated on Shirt Tail canyon, midway between Forest Hill and Iowa Hill. The ledge is a southeast and northwest one, four feet in width and of average hardness and moderate grade. It has been worked for the past four years with good results. The crushing plant consists of two five-foot Huntington mills. The present working tunnel crosscuts the ledge 300 feet in; 800 feet have then been run northerly on the ledge, where another fine body of ore has been struck, averaging $10 a ton. At 300 feet a winze was sunk 100 feet to determine the depth of the chute, and above this a part has been stoped; but as the ore had to be hoisted here, and again by incline at the mouth of the tunnel to the mill, it proved too expensive working for the present. The mine thus thoroughly prospected and opened, Mr. Reed is preparing to run a tunnel 400 feet lower on the mountain side, as working at present is at a disadvantage with the mill above the tunnel. This new tunnel will be 1200 feet in length. Compressors, power drills, etc., will be put in. A stamp-mill will be erected at the mouth of the new works. A year will be necessary to complete the improvements. At present about 20 men are employed, and from 15 to 20 tons of ore milled per day.

THE PIONEER OR LYNN.—This has a 20-stamp mill, and is situated about three miles northwest of Damascus. The mine is owned by Jas. G. Fair and A. E. Davis, and under the superintendence of Mr. D. J. Sullivan has developed into a steady dividend-payer. There are two ledges on the property, the Pioneer and the Lynn or back ledge. The course of each is northwest and southeast, dipping east at 60°. The Pioneer ledge was worked as early as '58. The Lynn was discovered about eight years ago, and was incorporated with the Pioneer about five years ago. They are both worked through the same channel. A lower tunnel strikes the Pioneer at 400 feet, where it has been stoped a depth of 300 feet. This tunnel has been run ahead 1000 feet to the Lynn ledge, upraised 180 feet and run south on the ledge 500 feet. This drift then connects, by another upraise of 220 feet, with an old tunnel. Work at present is going on in the extreme south end of the drift, stoping and driving ahead in high-grade rock. There are 520 feet of backs and no end of good ore in sight.

The mill is 1100 feet vertically below the mouth of the tunnel, near the river. The ore is transmitted by a gravity tramway 2700 feet in length. Twenty-five inches of water under 600-foot head, with 3-foot Knight wheel, lift 15 stamps of 750 pounds. Five stamps were not dropping on account of slack water. Forty men are employed.

DORER QUARTZ MINE.—This is situated not far from the Pioneer, and between the north and south forks of the north fork of the American river, and is owned by Richard Dorer. It has a ten-stamp mill, which was not running, but was expected to start up before long. This is a small hut good and paying mine. There are three tunnels. The ore is transported to the mill by a 3100-foot tramway.

A short way above and east of this is the Sentinel of the Dorer Bros., a good ledge and a 150 foot tunnel.

Lately some very rich ore has been taken from the Pedlar, a supposed extension of the Lynn. This will probably be bought and operated by San Francisco parties. In the same locality is also the Blue Bell, a good property on which little has been done, but which is for sale.

THE HOMESTAKE.—Near Forest Hill and two and one-half miles east of town is the Homestake quartz mine, with a five-stamp mill. The mine is idle on account of too little funds and too much water. The ledge is nearly vertical, averages three feet, and very loose in structure, carrying immense quantities of water.

THE AMERICAN BAR LEDGE.—This is deserving of attention, as it is likely soon to become the biggest quartz operation in the county. It is situated three miles south of Michigan Bluff, on the middle fork of the American river. It has lately been sold to D. Chapman, superintendent of the Taylor mine of El Dorado county. As early as '55 a 15-stamp mill was built on this ledge, but was carried away in '61–62. The ledge averages 20 feet, and has a general northwest and southeast direction. It has paid immensely rich in the past. In '67 a five-stamp mill was built, which ran a short time, but, through mismanagement and misunderstanding, it shut down and has lain idle for 20 years. Mr. Chapman intends putting up, in time, an elaborate plant, to be operated by electricity. A late assay of ore yielded $15 per ton.

THE IDLEWILD OR TAYLOR MINE.—The Taylor mine, which I have had occasion to mention before, is about four miles below Georgetown, in El Dorado county, and is the most northern point of active development, as far as known, on the mother lode. The ledge strikes northwesterly, dips about 60° east from the horizontal, and varies in width from two to forty feet in thickness, while averaging 20 feet. There are frequent injections of auriferous slates into the ledge. The walls are of diabose, gouge and black slate, and the ledge lacks none of the characteristics of the mother lode veins. The rock is continuous milling and low grade. The mine is developed by a 500-foot shaft, double-compartment, and five levels, the longest of 500 feet. Work is going on in all. The work at present is entirely that of development; no stoping is being done, and the rock for the mill comes from the gangways.

There is probably not a more substantial or more satisfactorily operated mine in this part of the State. When the 20 stamps have been added to the present 20-stamp plant, and improvements now under way concluded, there certainly will not be a better-equipped mine in this northern section. Mr. D. Chapman is superintendent.

The changes and additions that have been going on for some time are about completed. The milling plant thus consists of 40 steel stamps of 1000 pounds each, the 20 lately put in being ready to start in a few days more. The stamps are given a 4½-inch drop and a speed of 105 drops a minute. The screen used is a 50-mesh perforated steel, and the average crushing per stamp is three tons in 24 hours, which is a remarkably good showing on hard rock. The free gold occurs in minute particles. The sulphurets are saved on four Woodbury concentrators. Four more are to be added. A large-size Gates crusher, with a capacity of 25 tons an hour, and of 13,000 pounds weight, is part of the new equipment. A 75 horsepower Dodd wheel has also been put in.

The notable feature of the mine outfit is the electrical lighting and pumping apparatus. Located in the mill is a 25-horsepower, constant-current power-generator. This supplies the two motors in the mine; one at the 500 station, which pumps the water from levels 3, 4 and 5 to the 200 level, where it is taken up with the drainage of 1 and 2 and carried to the surface. These motors are each of ten-horsepower, and drive two Richards pumps, built by the W. T. Garrett Company of San Francisco.

There is also a dynamo furnishing power for lighting purposes. It is a 110-volt machine, constant potential, with a light capacity of 150. There are about 200 lights wired up and distributed throughout the mill, hoisting works, mine, office, boarding-house, lodging-houses, five residences and stable. The special feature of the plant is the underground lighting—the shaft, stations, gangways and stopes are all thus lighted and not a candle is necessary. This entire plant was furnished by the Electrical Engineering Company of San Francisco, and was put in under the direction (and is now under the supervision) of Mr. G. L. Grant, and works to entire satisfaction.

Electrical drilling has been tried, but for the present it was not found to be a success. Electrical drilling machinery is still in an experimental stage and its possibilities yet undetermined. For the present all drilling is done by hand, but it is intended shortly to supersede this method by power drilling.

THE ARGONAUT.—Three years ago the ten-stamp mill was burned, and since this property has remained idle. It is a north continuation of the Taylor lead and one mile distant from that mine. The Argonaut is a full claim of 1500 feet and held under U. S. mineral patent. Mr. John Smith of Greenwood is the owner.

This mine was well developed before the mill burned. There is a 500-foot tunnel crosscutting the ledge 200 feet below the surface, where it is 100 feet in width. At this point there was an upraise of 20 feet and an under stope of about 30 feet. The ore is free-milling and low-grade, said to average from three to five dollars a ton. Owing to the quantity of ore, though of such low average, with cheap and modern facilities for working it, this property would readily prove valuable and is so considered now. The

surface croppings are 40 feet in width, and, as has been seen, the ledge grows with depth, showing an immense gold-bearing ore body. Mr. Smith is desirous of interesting capital in the Argonaut and doubtless the property could be purchased at reasonable figures—generally a scarce commodity among holders of mining claims. However, there is no doubt of the value of this property, and proper men and capital taking hold of it would add one more great enterprise to mother-lode operations in El Dnradn county. CHAS. E. TOWNSEND.

The Ynkon River Placers.

The Juneau (Alaska) *Mining Record* of October, says: On Thursday evening last there arrived in Juneau Mr. Neil McArthur and Mr. Chas. Maynard, the former being a well-known pioneer miner and prospector and a perfectly reliable and truthful authority on mining matters in this section; the latter is also a miner of experience and has been in the Yukon country over a year in duration. Neil McArthur, who has been mining in the Yukon country since 1888, described disinterestedly some facts relating to mining on Forty Mile and other creeks and tributaries, the publication of which may have a good effect upon those who may next spring contemplate going to these diggings, and who may become excited over what is a fallacious report.

After mining on Forty Mile creek and neighborhood with moderate success, he discovered on the 15th of September, 1891, a tributary at the extreme headwaters of Forty Mile creek, and last May a tributary on Sixty Mile creek called Miller creek, all of which empty into the main Yukon river on the south side going down stream. About 130 men wintered there last year and there will be an addition to this number of 40 or 50 during the present winter.

The season is open about the 27th of May for sluicing and closes about September 1st. This is, therefore, a very short mining season, and the diggings would have to be very rich to be at all remunerative. Such diggings have not yet been found, but the prospects so far obtained are encouraging and will no doubt in a short time lead to a good mining camp being built up. At present there are drawbacks from long-continued high water in creeks, and during a dry season an absence of surface water in the gulches where fair prospects are obtained. The average amount made per man per diem, when working, is from an ounce to $20. Wages are $10 a day; the cost of living about $1.50 a day. There are sufficient supplies in the country in the hands of Messrs. McQuestain and Harper for the number of men there, but not sufficient if a rusb took place. These traders ship their goods from St. Michael's up the Yukon by the Alaska Commercial Company's steamer Arctic, which makes two trips a season to Forty Mile. A small steamer, the Yukon, arrived also with 40 tons shortly before McArthur left. It was also reported that J. J. Healy was coming in with a stock of goods and that he was going to build a small steamer to freight them, but on the 15th of July he had not arrived at St. Michael's and it was generally considered very unlikely that he could build the boat in time and make the trip before winter set in.

In referring to the untrustworthy reports about the country, it is a fact tbat no such sum amounting to $170,000 in placer gold, mined by 17 men during this year, has been shipped to San Francisco. It is also untrue that one man dipped up with a spoon gold nuggets to the amount of $11,000. On the whole there is no new cause for excitement, the prospecting of so large a tract of country by so few a number of poor men is slow and arduous work, but eventually there may be found profitable diggings. In publishing sensational and lying reports, much injury will be done to the country and great hardships will be entailed on those who may rely upon their truthfulness, unless they are well provided with means sufficient to keep them in the country for at least a year. If a rush takes place, as is predicted by Captain Worth, it will most certainly end like many others bave done before, in disappointment and hardships. Miners must therefore be wary in noticing reports, most probably made by selfish and interested persons.

It may be again mentioned that the Government of Canada, like that of the United States, bas utterly neglected tbis region and done nothing wbatever to build roads, trails, or assist the pioneer miners to develop the resources of such a ricb country. Neither has there been any Government representative in the Yukon mines, not even a civil magistrate.

Electic Traction on Highways.

A London dispatcb states that anotber electric omnibus, operated by a secondary battery, has appeared in the streets of that city. It carries 12 inside and 14 outside passengers. Sixty-eight cells are required to drive it, bringing the total weight up to about 7000 pounds. Whatever may be the fate of this particular vehicle, it is reasonable to suppose that but few years will now elapse before self-propelled vehicles will be extensively used on paved streets and highways, especially where the dirt road has been replaced by crushed stone. The steam traction engine is used to a considerable extent in Europe, and is being gradually introduced in America. In California it is encouraged by tbe excessive local freight rates, and tbere, as elsewhere, the improvement of common roads will, of course, basten its more geoeral adoption. There has been some discussion of the probability of the electric railway being introduced for the use of the farmer in hauling his produce to market, and while this plan would no doubt be feasible in certain districts, it is difficult to imagine tbat it would ever become popular if actual casb was to be paid out for transportation. The farmer wbo was deprived of the privilege of hitching up his team and driving a load to market would soon arrive at tbe opinion that life was not wortb living. Whatever may be the coming system of transportation, the movement for better roads is gaining strength throughout the country, and the economic advantage, even with the use of horses, will more than offset the cost nf the improvements. In our thickly settled States, the building of railroads has practically ceased, and instead of bonding towns and cities to encourage competing lines, more attention will naturally be devoted to facilities for reaching such railroads as are already in existence. This may take the form either nf bettering the highways, nr establishing electric railways. This is to-day the most important public issue before the people, the tariff question being a mere political war-cry, in which both great parties purposely exaggerate the facts for the purpose of befogging the voters. The great need nf this country is the devotion of more capital to public improvements nf a permanent character, and New York City has recently shown unusual enterprise in this direction. The completion of the new Croton Aqueduct has been followed by more extended repaving of the streets than has been witnessed since the work was originally done. Every undertaking of this character is valuable as an object lesson. When the fact becomes thoroughly established that good roads are beneficial to all citizens, whether owners of vehicles or not, there will be no faltering in this important line of improvement.

Alloys of Iron and Chromium.

At the last meeting of the British Iron and Steel Association Mr. R. A. Hadfield read a very interesting paper on the alloys of iron and chromium. He began by stating that so far no exact statement had been presented to the institute as to the properties of chromium steel. He then described the results obtained with combinations of iron and chromium. Judging from these results, he thought that it was probable that chromium steel had an important future before it; and that the special question of steel alloys or combinations would be found to possess considerable practical importance to the world at large, and perhaps be the means of eventually enabling engineers to design and carry out works of a magnitude which even at present was not possible. It was to France that we were indebted for most of our information as to the metal, its properties, and tbe development of its use. It was discovered by Vauquelin towards the end of 1797; and no doubt its discoverer would be surprised if he could see that to day we were principally indebted to this metal for the remarkable properties possessed by modern armor-piercing steel projectiles, properties which bad enabled tbose of six-inch caliber to penetrate compound armor-plates 10½ inches in thickness, remaining practically unaltered in form, or those 13 5 inches in diameter fired from the 63-ton breechloading gun to penetrate over three feet of steel and wrought iron. The application of the metal in metallurgy to more peaceful purposes had not yet been extensive, but that is use would increase could not be doubted. It appeared that Faraday and Stodart in 1820 were the first to investigate tbe effect of the addition of chromium to iron and steel, much more exhaustive experiments being made in the following year by Berthier. In 1861 the first commercial application of chromium to iron and steel manufacture was suggested by Robert Mushet; but it was Mr. Julius Baur, of New York, to whom the credit must be given of first introducing on a practical scale tbe manufacture of chromium steel. Mr. Baur took out an American patent in August, 1865, and has followed it up by further patents. Since then his process has been continuously carried out by the Chrome Steel Company, of Brooklyn, which had for 20 years produced chrome steel.

After describing the metal and its compounds and their actions on various substances, Mr. Hadfield gave a resume of early experiments in the addition of chromium to iron and steel. He proceeded to discuss the production of ferro-chromium from chrome iron-ore, a uniform ferro-chromium being the first step in the manufacture of malleable alloys, since the simple addition of chromium to molten iron was out of the question. As regarded the use of chromium as an addition to cast iron there did not seem to be a probability of any large application. It conferred hardness, not per se, but owing to the property it possessed of driving the carbon present into the combined form.

Proceeding witb a description of the results of his experiments, Mr. Hadfield said that the material he used as a basis was good wrought-iron scrap, sbowing small percentages of sulphur and phospborous. To this was added varyiog quantities of ferro-chromium containing six per cent of carbon and 66 per cent of chromium. The manufacture of tbese alloys was not easy owing to the refractory nature of the rich ferro-chromium, and pieces of the ferro-chromium came out of the crucibles unmelted, tbough subjected to several hours of tbe most iotense heat of a Sheffield crucible furnace. If the temperature was allowed to diminish even for a sbort time the contents of the crucible were liable to become solidified. When the melting operation was carefully carried out and the heat properly maintained, the pouring possessed no special difficulty; in fact, the product was as fluid as other alloy steels, but cooled rapidly, much more so than carbon-steel.

The Apparent Growth of Gold.

Of the many myths prevalent regarding gold, the greatest one of all is its growth. Of course there are many interesting instances where ancient worked-out galleries in mines are slowly closing up by the incrustation process, so that space long ago excavated is being filled with an accumulation resulting from the percolation of water througb the adjacent wall-rock. This water has in chemical combination such minerals as iron, copper, sulpbur, and the precious metals, which are deposited in the open crevice, making for a second time a mineralized body which will show by analysis the above named and many more minerals. In fact, I have had this actual experience resultant on tbe examination of an old gold mine in Honduras, Central America, that had been worked some time prior to any history we bave of that country. This circumstance gave to the natives the idea that gold grew, and they so expressed themselves; while it seemed in the case of one individual a transmutation idea had permeated his head, for he explained that the green carbonate of copper was undergoing a change into silver, while the silver in turn would develop into gold.

In India I found a caste nf mining people who believed that gold grew in the bottom of the large lakes situated in that country. They expressed no practical reason other than fairy-tale superstitions. And even in this country there are converts to the idea. I was much amused and interested some years ago to hear an intelligent acquaintance maintain in strong and not altogether religious terms that "the stuff grew and he knew it." His experience was based on the fact that in a certain pile of tailings, resulting from the milling of heavy sulphuretted gold ores, he had treated at one time several tons with no result. Again, in three years time he discovered by a pan-test that the same pile had gold in it, whereupon he treated several tons with the approximate result of nne dollar per ton. After this last treatment he declared the tailings were barren of gold so far as he cnuld detect by the mechanical means at hand. In order to convince him I selected an average sample, which on assay gave 2 pennyweights 20 grains gold per 2000 pound ton. This was considered not worth the working. But my friend maintained that the gold would grow again in two or three years.

True to his word, in two years he was at the pile again, and by his crude but sure method was saving one dollar per too from the ore that would yield *nil* by his methods two years before. Again I took samples for assay and was somewhat surprised to find that the value had increased just 50 per cent, as the result of my determination was 5 pennyweights 16 grains per ton. On investigation, I found the sulphurets to be of a character readily decomposed by the elements; in fact to such an extent that, as I afterwards calculated, over one-half the pile must have been decomposed or washed away, so that with the decomposition a certain rapid concentration was maintained by the action of heavy rains, and the natural advantage this particular ground offered causing the gold to remain behind while the oxides were carried away in suspension by the water. My explanation has failed to convince my friend of the pick and shovel. As the gold in the tailings has become about exhausted, his last attempt to make it pay was a failure. He remains strong in the conviction that a few years will grow it again.—Science.

The New Wet Process.

A London correspondent writing to the Adelaide *Advertiser* in reference to experiments in the treatment of refractory ores from Soutb Australia and elsewhere, reference to which has been made in cablegrams, states that hitherto no system has been successful in extricating the full assay value of the metals contained in complex ores; but two eminent Scotch metallurgists claim to have solved the problem, and the inventors claim that by their process practically all gold, silver, copper and other metals contained in any kind of ore can be extracted with great economy in plant, labor and time, the process being specially applicable to the treatment of copper ore associated with gold and silver, such, for instance, as the ore raised at the Queen Bee mine, which has hitherto been sent out of South Australia for treatment, and also the Reedy Creek gold and copper ore, which has defied all efforts to extract the gold from the pyrites in paying quantity in consequence of its being associated with copper. Ore from this mine, bowever, was particularly amenable to the new process. The full assay value of both gold and copper was readily obtained, as well as a small quantity of silver. The ore tried was concentrated pyrites. Notable features of this new process are that better results are obtained when treating tons than when dealing with small parcels in the laboratory, and that it is more effectual with a low-grade ore containing from 3 to 8 per cent of metal than with ores of a high percentage. A series of experiments with South Australian and other ores has been made under the supervision of Mr. T. A. Masey, F. G. S., who has acquired the Australian rigbts, and arrangements have been made to erect a furnace and plant at the Blinman mine to deal with 50 tons of ore daily. A similar plant to treat the same quantity of ore per day will be erected at the Aclare mine, and when in operation the directors and managers of the Broken Hill mines will be invited to inspect the process at work. Mr. Masey is confident that the process will solve the much-vexed question of the Barrier of treating at a profit low-grade sulphide ores containiog lead, silver and zinc.

The South Australian ores that have been tried by this process are from the following mines: The Blinman, containing copper; Reedy Creek, copper, gold and silver; Queen Bee, gold, silver and copper; and Aclare, zinc, silver and little gold (3¼ dwt). In each case the full assay value of each metal was obtained at a minimum of cost. The actual cost is at present a trade secret, but as tbe chief chemical used is inexpensive, being a by-product from another manufacture, and the process is a quick one, involving comparatively little labor, the total cost will be considerably less than the refining charges exacted by smelters in Australia.

THE cost of a world-wide patent is disclosed by the following incident: Two French gentlemen patented a hypodermic syringe all over the world. This fact arrested the attention of a writer in *Le Figaro*, who at once became curious to know the cost of the operation. It seems there are 64 countries where an invention can claim protection. Sixteen of these, remarks the *Paper Record*, are in Europe, 8 in Africa, 4 in Asia, 27 in America, and 9 iu Oceania. The total value of these 64 official scraps of paper or documents amounted to the sum of $17,000.

Mechanical Progress.

Protecting Iron Tunnel Roofs from Corrosion.

In the last issue of "Transactions of the American Society of Civil Engineers," Mr. James G. Dagron, M. Am. Soc. C. E., describes a method adopted by him of protecting from corrosion iron work used as a covering for tunnels. On the line of railway connecting the Baltimore & Ohio and Philadelphia & Reading railways, in Philadelphia, the headroom in places is not sufficient to permit the use of an arch; and consequently the street above is supported on a buckle-plate flooring carried by transverse iron girders.

Trains have been running through this tunnel since September, 1886, and in the winter of 1890–91 the attention of the author was called to the very serious corrosion of the iron work taking place under the combined action of gas and steam from locomotives. He was instructed to devise some means of arresting this action and proceeded as follows:

The iron work was thoroughly scraped and the girders were given two coats of asphalt paint. Skewback tiles were then placed in position on two continuous girders and a flat arch of hollow fire-brick tiles was put in and each joint thoroughly sealed by cement mortar by a workman who was sent into the space between two transverse girders and the buckle-plates. After sealing the upper sides, a one-inch coat of cement mortar was applied to corrugations left on the under side of the arch for this purpose. The cost of the work, including the painting of the iron work, was $1.40 per lineal foot of arch, or $0.44 per square foot of arch. Omitting the painting, the cost was $0.357 per square foot of arch.

Mr. Dagron says the tunnel is much freer from smoke since the arch was put in, as the girders held the smoke. The buckle-plates, which were galvanized, were not affected by the gas or steam. After four months there is no evidence of cracking in the one-inch cement coating. It is less exposed to variation of temperatures than it would be outside the tunnel. In answer to a query as to why it would not do to apply the cement directly to the iron, it was stated that it would be much more difficult to make it adhere, and the direct heating of the iron in this case would be liable to cause trouble in expansion and contraction of the metal. It is supposed that the corrosive action of the gases also is largely due to the heat. A member said that galvanized iron would not answer as a protection; it had been tried and abandoned on his railroad, and its use for cornices in stations was also discontinued, as they were totally destroyed within two years.

Process of Iron-Ore Separation.

Mr. Henry H. Eames of Baltimore county, Md., has patented a process for the extraction of iron from gangues, ores or sponges in which they exist. The apparatus for the purpose consists of an endless belt or band which has along its surface a series of conducting strips and by means of a series of rollers above and below the band it is made to assume an undulating, corrugated, or serpentine form. This band is placed in an inclined position, so that the ores dropped upon it travel naturally upon an inclined corrugated plane. Means are also provided for imparting to the strips upon the band or passing through it an electric current. Upon this corrugated band the ores or gangues are dropped. The current passing through the conducting strips, crossing the same, causes the particles of iron on the band to attach themselves to the conducting strips. At the same time a stream of water is directed upon the band, which, being inclined, flows in the direction opposite to that in which the band is traveling, washing backwardly the gold, or copper, or other metal composing the gangue or sponge which does not adhere to the metal strips which continue to flow backwardly until washed off of the lower end of the band into a receptacle placed there to catch them. The iron particles continue to adhere to the strips and travel with them to the other end of the apparatus, when the circuit passing through the strips is broken and the iron particles fall off upon the ground, or into a receptacle at that end.

To further describe the process it may be said that the operator may take the gangues, ores or sponges and grind or pulverize them, then pass a current of electricity through a copper wire or other conductor and bring this conductor in proximity to or in contact with the divided material, when the iron particles will attach themselves to the conductor. If the wire be then removed, the particles of iron will still adhere to it and immediately drop off when the current is broken. The same thing may be accomplished by placing the ground gangues in water into which a conductor is introduced, passing an electric current through the conductor, and stirring up the divided material. The particles of iron will adhere to the conductor, which may then be removed from the water, and when the current through the conductor is shut off, the iron will drop therefrom.—American Manufacturer.

Inventors not Mechanics.

It is fortunate that the inventor of a machine is so seldom a good mechanic, for if he were he would never have the courage to attack his problems so boldly. Such an inventor seldom, if ever, does more than to demonstrate in a crude way the possibility to do a certain thing by a new method, or to do by mechanisms what previously had been done by hand. If, then, the inventor tries to manufacture his crudity, he generally fails, for such monstrosities, as a rule, are not manufacturable by the usual methods of modern manufacture at a price that permits of their being sold at a profit. Now, it is just at this point that the trouble begins between stubborn inventors and capitalists whom they have interested in their devices. The mechanics who have been hired to make the machine will complain that the thing cannot be made like the model by tools for divers reasons, one of which generally is because such model is such a ramshackle affair that it cannot be made by tools to duplicate it.

These mechanics will suggest other movements to do the work, but the inventor will object and demand that his contrivance be adhered to. This being done, the cost is found so great that no profit is possible. Then capital will object, and the inventor will insist, and it is only a matter of time when he goes out of the concern, and then the device will be remodeled on mechanical lines. The point to be made here is that after an impractical man has made a thing that demonstrates the possibility of doing a thing that is new and good, let him turn it over to expert mechanics to remodel in good modern mechanical shape, and rest content with showing the world how the thing could be done, permitting others to substitute the more desirable movements to do it. He thus can retain his hold and gain credit, where in the other case he loses all and gets the reputation of being a crank.—Manufacturers' Record.

BRASS CONDENSER TUBES.—Some brass condenser tubes in the U. S. cruiser "Baltimore," after being in service for a year or more, were found to have experienced a peculiar change. In many places the metal was changed to almost pure copper, of a spongy texture, the zinc having completely disappeared. An investigation showed the probable cause of the failure to have been an electrolytic action between the tin-lining of the tubes and the brass, the sea-water circulating through the condenser forming the electrolyte. Had the tin-coating remained perfect, no corrosion would have resulted; but the mud and grit carried in suspension through the condenser cut away the tin-coating in spots, and it was at these spots that the change of the metal occurred. It was concluded that if the tubes had not been tinned at all they would have remained intact.—Engineering News.

TESTING BOILERS.—British marine engineers are again discussing the desirability of agitating for a change in the system of testing boilers, with a view to reducing the thickness and weight of the shells. It is asserted that of late years material and workmanship have so much improved that the hydraulic test at present imposed by the Board of Trade and insurance companies might well be reduced by one-half to 90 pounds over the working pressure, as is now the case with British ships of war. The saving which this would effect may be estimated from the fact that in the new Cunarder "Campania" about 1200 tons of weight are absorbed by the boilers alone.

HORSESHOES OF ALUMINUM.—Aluminum horseshoes have been tried in one of the Finnish cavalry regiments. A number of horses were shod on one fore foot and one hind foot with this metal, ordinary iron shoes being used on the other feet. At the end of six weeks, during which time the animals had been moving on a hard and stony road, it was found that the aluminum shoes had worn rather better than those of iron, and not one of the former had gone to pieces.

Scientific Progress.

Why Is Sea-Water Salt?

This question, says W. M. Williams in *Science*, has been regarded as a mystery and has given rise to some curious speculations, but a little consideration of the subject must, I think, satisfy us all that it would be very wonderful, quite incomprehensible, if the waters of the ocean were otherwise than salt as they are.

The following explanation was first suggested to myself many years ago when receiving my first lessons in practical chemical analysis. The problem then to be solved was the separation of the bases dissolved in water by precipitating them, one by one, in a solid condition; filtering away the water from the first, then from this filtrate precipitating the second, and so on, until all were separated or accounted for.

But in doing this there was one base that was always left to the last, on account of the difficulty of combining it with any acid that would make a solid compound, a difficulty so great that its presence was determined by a different method. This base is soda, the predominating base of sea-salt, where it is combined with hydrochloric acid. Not only is soda the most soluble of all the mineral bases, but the mineral acid with which it is combined forms a remarkably soluble series of salts, the chlorides. Thus the primary fact concerning the salinity of sea-water is that it has selected from among the stable chemical elements the two which form the most soluble compounds. Among the earthy bases is one which is exceptionally soluble,—that is, magnesia,—and this stands next to soda in its abundance in sea-water.

Modern research has shown that the ocean contains in solution nearly every element that exists upon the earth, and that these elements exist in the water in proportions nearly corresponding to the mean solubility of their various compounds. Thus gold and silver and most of the other heavy metals are found to exist there. Sonnenstadt found about 14 grains of gold to the ton of sea-water, or a dollar's worth in less than two tons.

As the ocean covers all the lower valleys of the earth, it receives all the drainage from the whole of the exposed land. This drainage is the rain-water that has fallen upon this exposed surface, has flowed down its superficial slopes, or has sunk into porous land and descended underground. In either case the water must dissolve and carry with it any soluble matter that it meets, the quantity of solid matter which is thus appropriated being proportionate to its solubility and the extent of its exposure to the solvent. Rain when it falls upon the earth is distilled water nearly pure (its small impurities being what it obtains from the air), but river-water when it reaches the ocean contains measurable quantities of dissolved mineral and vegetable matter. These small contributions are ever pouring in and ever accumulating. This continual addition of dissolved mineral salts without any corresponding abstraction by evaporation has been going on ever since the surface of the earth has consisted of land and water.

An examination of the composition of other bodies of water, which, like the ocean, receive rivers and rivulets and have no other outlet than that afforded by evaporation, confirms this view. All of these are more or less saline, many of them more so than the ocean itself. On the great Tableland of Asia, "the roof of the world," there is a multitude of small lakes which receive the waters of the rivers and rivulets of that region and have no outlet to the ocean. On a map they appear like bags with a string attached, the bag being the lake and the string the river. All these lakes are saline, many of them excessively so, simply because they are ever receiving river-water of slight salinity and ever giving off vapor which has no salinity at all. There is no wash through these lakes as in the great American lakes, or those of Constance, Geneva, etc.

The Sea of Aral and the Caspian are lakes without any other outlet than evaporation, and they are saline accordingly. The Dead sea, which receives the Jordan at one end and a multitude of minor rivers and rivulets at its other end and sides, is a noted example of extreme salinity. It is, as everybody knows, a sea or lake of brine. The total area of land draining into the great ocean does not exceed one-fourth of its own area, while the Dead sea receives the drainage and soluble matter of an area above 20 times greater than its own, and thus it fulfills the demand of the above-stated theory by having far greater salinity than has the great ocean.

According to this view the salinity of the ocean must be steadily though very slowly increasing, and there must be slowly proceeding a corresponding adaptation or evolution among its inhabitants, both animal and vegetable. The study of this subject and the effect which the increasing salinity of the past must have had upon the progressive modifications of organic life displayed by fossils is, I think, worthy of more attention than it has heretofore received from paleontologists.

OYSTERS AND MUSSELS AS WATER FILTERS.—It has been observed that sea water, which always holds solid particles in suspension, becomes clear with surprising rapidity when an oyster or a muscle is placed in a vessel that contains it. These animals, in fact, as soon as they are immersed in their natural element, establish a rapid current of water between their separated valves. Of the particles that such current carries along, some are agglutinated into large lumps by a mucous secretion of the mantel and then immediately rejected, while others traverse the digestive tube, to be afterward expelled in the form of solid excrement. It results that, after the lapse of a very short time, the mollusk has filtered the surrounding water, but the amount of filtered water is not the same with all oysters and mussels. The researches of Mr. H. Vaillanes show, in fact, that mussels, in the same period of time, filter three times as much as the French oyster, and the Portuguese oyster filters five and a half times as much. From the standpoint of oyster culture, these results explain the cause of that dying off of oysters that culturists have been complaining of for some years, and indicate the remedy for it; that is, the suppression of the mussels and the proscription of the Portuguese oysters from the parks in which the French oysters develop. Mr. Vaillanes' researches permit also of comprehending the importance of the role that these mollusks have played and are still playing in the economy of the seas and the building up of the continents. These animals, which endure changes of saltness better than others, constitute colonies that are often immense and elevated as barriers at the confines of marine and fluvial waters. They are powerful filters charged with freeing the latter of the solid materials that they are carrying to the ocean.—Scientific American.

COMPRESSION OF TIMBER.—The compression of timber is becoming a growing industry, and the material thus treated is being applied to a variety of useful and ornamental purposes, especially in the field of carving, most attractive and artistic designs being thus brought out, pronounced in many cases fully equal, if not superior, to anything ordinarily produced in that line. The wood to be employed in this manner, says the *Age of Steel*, is compressed either in its natural condition, or after being steamed, and it is found that the hardest, well-seasoned ash timber, say of four inches thickness, can be pressed into about three inches without injuring the fiber. Moreover, it is also found that wood can be "upset" the same as iron; and the increased tenacity of bent and compressed wood of this sort, as compared with the same in its natural state, is declared to be something surprising. In mechanical operations, compression is now applied to spoke tenons, the work being described as very simple and rapid, the tenon properly tapered and ready to drive to its place, an increased strength being thus added to the wheel equal to three additional spokes.

WE remember seeing some experiments described, in which an attempt was made to determine the color that first exhibits itself in the transition from blackness to redness, as the temperature of a bar of (say) iron is raised. The experiments were, of course, carried out in a perfectly dark room. But there was considerable discrepancy between the results according to different observers. It would be interesting to know what photography would have to say upon the subject; plates specially sensitized for various regions in the ultra-red being employed. Would glow lamps heated electrically to dull redness, or a kind of thin metal extinguisher similarly heated by a Bunsen burner, give light sufficiently nonactintic for ordinary use in the photographic dark room?

COPYING PAPER has lately been prepared in such a manner that there is no necessity to moisten the sheet before taking an impression of the manuscript. This is done, says a contemporary, by moistening the sheets in a solution of a deliquescent salt, and once prepared in this manner the sheet is always ready for use. A French scientific journal recommends a solution of one-tenth part of chloride of magnesium or one-twentieth part of calcined chloride of lime.

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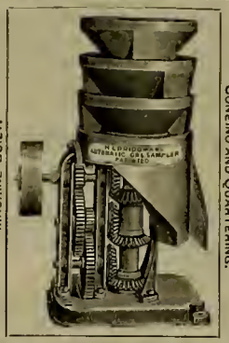

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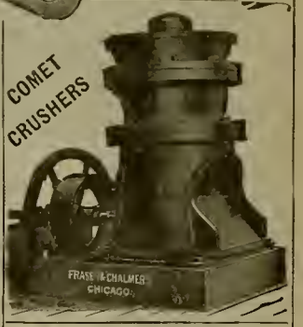

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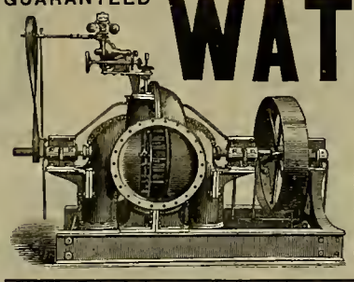

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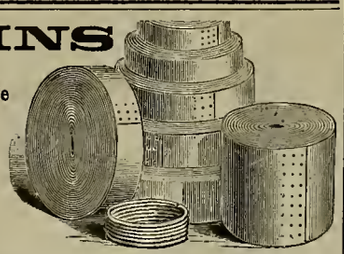

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The Electrical Habits of Iron.

It is strange, says *Industries*, how little is known about the loss of power in iron under reversals of magnetization. It has been known for many years that energy was lost when iron was magnetized and demagnetized, but the builders of dynamos had no clear ideas on the subject. Seven years ago Prof. Ewing and Dr. Hopkinson called attention to the loss of energy by hysteresis, apart from Foucault currents; but since then no information of any practical importance has been added. It seems as if everything connected with alternating currents is doomed to go through a period of harren quasi-scientific treatment before being studied and utilized by electrical engineers. The quasi-scientific method of treating iron is to take curves with a ballistic galvanometer. This is a cumbrous method, and does not give the information required. The engineer really wants to know what kind of iron gives least loss hy hysteresis, what maximum induction does it pay best to employ, and how much energy is wasted per cubic centimeter per cycle. To test a given sample, the obvious way is to make a little choking coil of it, and to measure the power lost by means of a wattmeter. This gives the information at once as regards the sample. If readings are taken at different electromotive forces, the losses at different inductions are obtained. The ballistic galvanometer method is merely an indirect and perhaps inaccurate way of arriving at the same result. Finding the qualities of different samples is a very small matter. The chief difficulty is to find good qualities of iron at reasonable prices, and what is wanted is the knowledge of the causes that go to make iron and mild steel good or bad. Makers of iron do not generally know anything about hysteresis, and electricians know little ahout iron, hut it is no use shirking the subject and reading papers to scientific societies ahout curves belonging to specimens obtained at random from unknown sources. Reams of paper have been covered with researches on curves of random samples, and they are absolutely useless. They may he of scientific interest; if so, well and good, but they are generally supposed to be for the benefit of the benighted and ungrateful practical man. So far, all the information the dynamo-maker has is that soft iron has comparatively little loss by hysteresis, and he pins his faith on some particular merchant who supplies him with a metal which he calls "best Swedish charcoal iron," but which is not generally labeled "Made in Sweden."

A few investigators have given the analyses of their samples, but we do not know whether the percentage of carbon is the salient quality, or whether minute traces of other suhstances increase or decrease the loss of power. Neither do we know how the treatment of the iron in rolling and annealing affects the magnetic properties. If investigators could only be induced to consider what practical people want to know, instead of what "looks deep in print," some useful information might be obtained.

An Idaho Electrical Transmission Project.

A company has been formed under the laws of the State of Illinois to utilize by electricity the power of the Shoshone Falls in the Snake river, Idaho. It is stated that the amount of available waterpower at these cataracts is second only to that of Niagara, and that it is constant all the year round. The principal fall is 950 feet wide and 210 feet high, although a second fall increases the total head to 290 feet. The newly-incorporated Shoshone Falls Electric Power and Irrigation Co., which is capitalized at $25,000,000, has secured control of both sides of the river at the falls, and proposes to erect a great plant for the generation of electric-power. The conformation of the banks of the river lends itself very readily to the scheme, and no tunneling will be necessary. Large power units will be employed, hut the details of the plant are still to he worked out. The Snake river flows through a canyon of considerable height, and this fact has heretofore prevented the use of the water for irrigating the surrounding valley, the soil of which is extremely fertile.

It is now proposed to carry the current along the river from the generating stations at the falls to points where the canyon-walls are lowest. Here, by pumping 40 feet, the water can he raised to the land ahove, where it is needed. Electric pumping-stations will he installed at these points, and the water will be raised into irrigating canals and sold to farmers. The rates now prevailing for irrigation are from $15 to $40 for hringing the water on the land, and then an annual rental of $2 or $3 per acre. It is estimated that, under the conditions existing, the expenditure of 5500-horse power will irrigate 120,000 acres of land. It is the intention to ultimately transmit power and light to the Wood River mining country also. The incorporators of the company are Nelson W. Perry, H. C. Baker and John B. Schmalz. Mr. Perry, who will have entire charge of the designing and construction of the plant, is peculiarly fitted for the work, as, in addition to a complete equipment as a mining engineer, he has a thorough knowledge of the applications of electricity. He was formerly editor of *Electricity*, New York, and is well-known to the electrical fraternity of Chicago, Cincinnati and New York. Ground will be broken for the works at the falls within 30 days.—Western Electrician.

Utilizing Earth Currents.

It has often been found that a formidable enemy when properly harnessed may become as formidable a friend and can then he made quite useful. While this has been done in a number of cases, it does not follow that this can always be accomplished. In an article published in this issue the author makes the ingenious suggestion that the earth currents, which are such a nuisance to telegraphers, might possibly be put to some use. While this would be desirable it is hardly likely that it will ever amount to much except as a mere matter of interest, for a number of reasons. In the first place the more frequent weak currents are too feeble to be of much use except possibly in a number of very limited cases for telegraphic purposes, but even then they are too unreliable and variahle, and the only saving would he in hatteries, which after all is not a matter of great importance. The strong currents are hy far too erratic to be of any use; besides, they seem to occur only every 11 years, and it would hardly be worth while to have any apparatus lie idle for 10 years to be used only during a portion of every eleventh year. While the voltage of some of these earth currents appears to be quite high, reaching 600 to 700 volts, it must not be forgotten that this is only between two points separated by a considerable distance. In the number of cases cited there would not be more than about one to one and a half volts per mile, and it would not be practicable to huild a line to utilize such a voltage for power or lighting purposes. Another thing is to be considered. This difference of potential in different parts of the earth is more of the nature of a charge in a condenser, which will no longer exist when the cause is removed and the two parts are connected by a wire. The only current that would be generated is during a charge and discharge. It is therefore not in the nature of a continuous source of electromotive force, as in the hattery or a dynamo, which is continually regenerated. Furthermore, a line wire does not, in that case, act as a return circuit for the earth, but the two are in multiple and the only current in the line would be its share when considered as a shunt to the earth. An electric storm, as at present understood, would treat the line wire as if it were merely a good conductor forming part of the earth; a hare wire, for instance, huried in the earth would prohably show about the same current as if it were overhead. While the suggestion of the author is an ingenious one, we think it is like others of a similar nature, as for instance the utilizing of the tides, on which inventors have spent more time than the possible results would warrant, and we would not wish, therefore, to encourage inventors to give much thought to a possihle commercial use of earth currents.—Electrical World.

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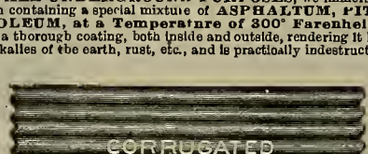

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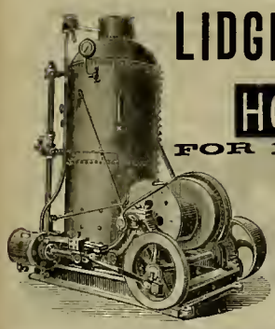

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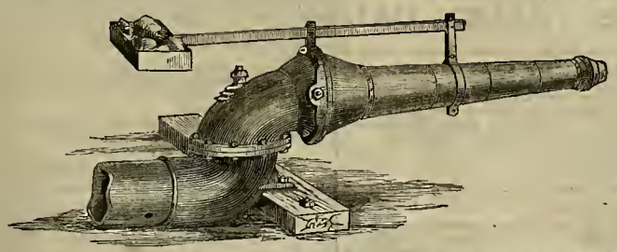

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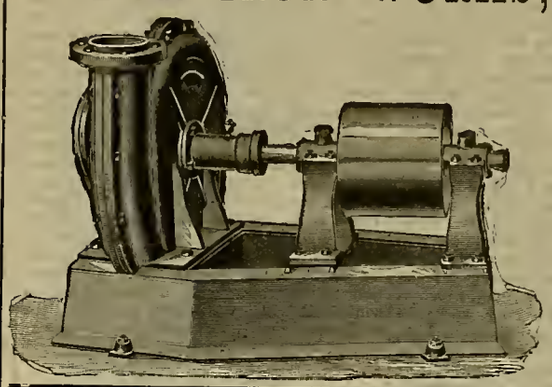

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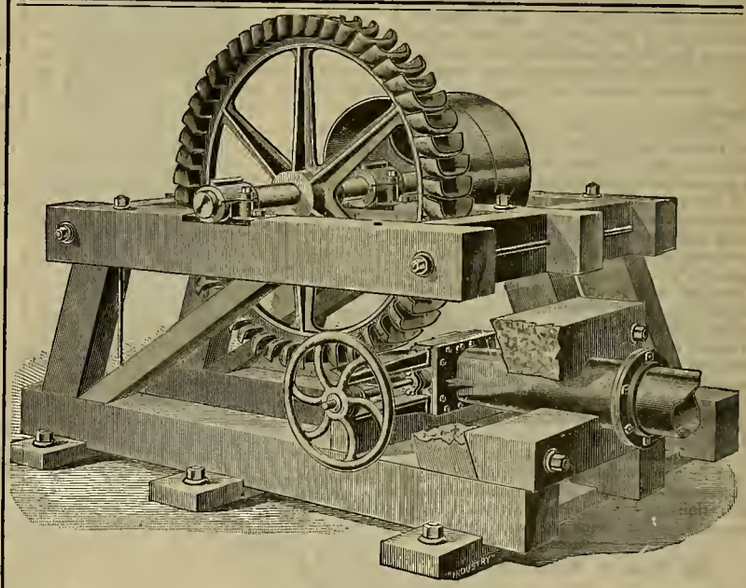

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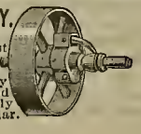

Useful Information.

Electricity and the Farmer.

The November number of the *Engineering Magazine* contains an interesting article by William Nelson Black, discussing the influences the electric motor is likely to exert in rendering farm life more agreeable. Mr. Black's views coincide perfectly with those defined in the *Electrical Review* for November 7, 1891, under the caption of "Electricity as a Reformer." The *Review* says:

We believe be correctly attributes the dissatisfaction with farm life and farming pursuits, and the large influx of population from country districts to the cities, to the comparative hardships and discomforts of country life instead of to the alleged gregarious tendency of the human family. When life in the country is attended with comfort and convenience, it will be preferred by a large proportion of the public to city life. Mr. Black thinks tbe electric motor will insure such a condition by enabling the farmer to readily market his produce; that it is not unreasonable to expect the electric railway to cover every township with a network which will permit free intercourse of all tbe residents, and that the opportunities thus opened for rapid transit of country-folks to and from the town, and easy communication *inter sese*, will make country life not only tolerable, but preferable to city life. The article only faintly touches a side of the subject which will be a more potent factor in the creation of this new social status. When electric railways cover the townships from end to end, every farm and every dwelling-house may be supplied witb power—a result which will transform the drudgery, which is now lts chief incident, into easy work; the plows and harrows, the reapers and mowers, will be pushed over their difficult paths by an easily-controlled electric motor; the churns and other domestic paraphernalia will spin merrily under the same influence, and tbe drowsy petroleum lamp which makes hideous a night in the country will give way to the incandescent lamp, and the evenings will become periods of brightness and pleasure.

The electric motor will do still more; it will furnish cheap power to the individual consumer, and, by permitting manufacturing to be conveniently performed in small plants, will diversify industry. It will prove a counter-irritant against trusts, and permit a clever mechanic to produce at home what now must be made in expensive plants, requiring a heavy capital for their maintenance. There will thus be opened wide the doors of competition, and the general public as well as the individual will prove the beneficiary. We may reasonably expect that the next decade will find the results herein referred to accomplished facts, at least to a considerable degree. A reaction in favor of the country districts is needed; the atmosphere of city life is unsuitable for the development of rugged manhood. The nation will gain vigor by a more uniform distribution of its citizens. During the last decade the flow of migration has been strongly toward the city; electricity will produce a change of tide.

The Flow of Water in Pipes.

Many formulæ have been devised by various engineers for expressing the relation between the velocity of flow in a pipe and the head required to produce it. Unfortunately all of them are complicated, and cannot be used for mental calculation or in making rapid approximations. It may be noted, however, that in a vast majority of cases arising in practice, the velocity of flow lies between two feet and four feet per second, and on an average is three feet per second. The head required to maintain tbis latter velocity through a length of clean cast-iron pipe is then

$$\text{Head in feet} = \frac{\text{Length of pipe in feet.}}{25 \times \text{diameter of pipe in inches}}$$

And the discharge in cubic feet per minute is very nearly equal to the square of the diameter of the pipe in inches, the error being under two per cent in excess. Both these calculations are easily performed mentally. For a velocity of one foot per second less than three feet per second tbe head must be reduced one-half and by a proportionate amount for intermediate cases. For a velocity of one foot per second more than three feet per second the head must be increased by seven-tenths times that required for a three-foot velocity, and that required for intermediate cases can again be determined by addlng a proportionate amount for that required for the one foot increase. In this way tbe head required to maintaln through a clean cast-iron pipe a velocity of not less than two feet a second, nor more than four feet a second, which are the limits usually adopted in practice, can be determined mentally with an accuracy sufficient for 99 per cent of the cases tbat arise in an engineer's practice. Having the discharge at a velocity of three feet per second it is of course easy to obtain the discharge at any any other velocity.—London Engineering.

THE INVENTION OF THE TELESCOPE.—The *Optician* says: Galileo is so popularly credited with the invention of the telescope tbat a few actual historical facts on the subject will not be out of place in these columns. The real inventor of the instrument was, without doubt, John Lippershey, a spectacle-maker at Middleburg, Holland; although, according to Descartes, the inventor was Adrian Metius, who wrote on October 17th, 1608, to the Government of Holland, stating that he as well as John Lippershey, was engaged in manufacturing the instrument "that brings distant objects near." Another document, however, of October 2d, 1608, recently found in the Government archives, is the petition from Lippershey praying for a 30 years' patent on his invention. This was refused him because the instrument could not be used with both eyes at once, and after he had made a binocular telescope the patent was again refused because telescopes were then being made everywhere. But, as a partial compensation for bis disappointment, he received an order to construct for the Government two binocular instruments, the lenses of which should be of rock crystal and for which he was to be paid 900 guilders, or about £60 apiece. There is no doubt, however, that Galileo first applied the telescope to astronomical purposes. But he constructed his instrument after he had learned from the invention of Lippershey that a combination of convex and concave lenses possessed the property of making distant objects appear nearer.

Weights of Lumber.

The Chicago *Timberman* issues a Vest-Pocket Inspection Book that contains the following. The estimates made are all based on the weight of 1000 feet of the lumber:

White oak	3,863
Red oak	3,396
Black walnut	3,176
White walnut	2,121
Cherry	3,023
Ash	3,400
Black birch	3,131
Beech	3,741
Yellow poplar	2,197
Maple	3,783
Hickory	4,349
White ash	3,000
Whitewood	2,19
Basswood	2,350
Rock elm	3 6 3
Norway pine	3,521
White pine, dry, rough	2,900
Yellow pine, short leaf	2,826
Yellow pine, long leaf	3,800
Cypress	2,300
Redwood	2,185
Gum	3,070
Dry lath	500
Cedar shingles	2 10
Pine shingles	240
Norway 6-inch fencing	2,900
White pine fencing	2,500
White pine ⅝ ceiling	1,200
Piece stuff, pine	2,500
Norway pine, ⅞ floor	2,200
White pine, ⅞ floor	1,8 10
⅝ ceiling	775
Fence siding	800

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Notice is hereby given that at a meeting of the Board of Trustees, held on the 22d day of Novembsr 1892, an assessment (No. 70) of Twenty-five cents (25c) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessement shall remain unpaid on the TWENTY-EIGHTH DAY OF DECEMBER, 1892, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 20th day of January, 1893, to pay the delinquent assessment, together with costs of advertising and expense of sale.

By order of the Board of Trustees.

ALFRED K. DURBROW, Secretary.

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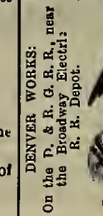
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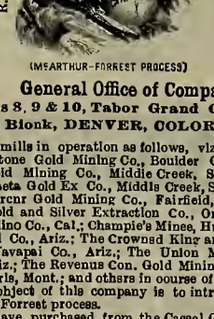
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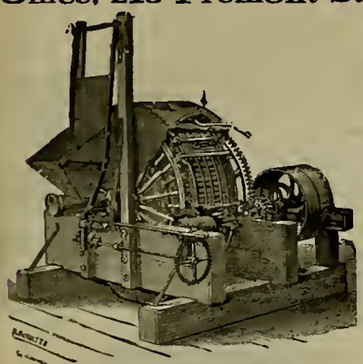

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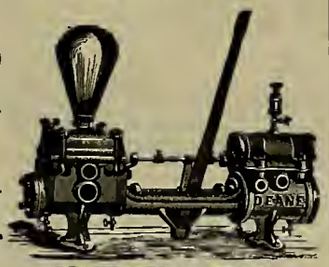

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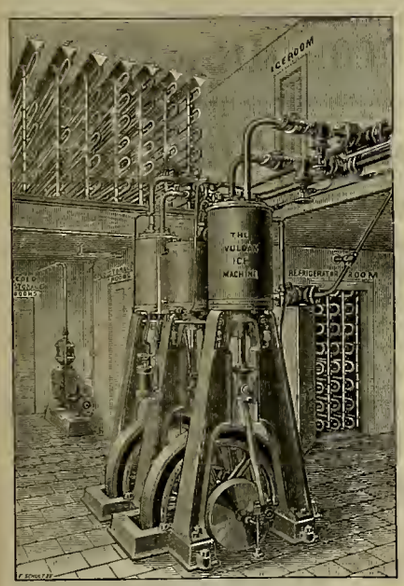

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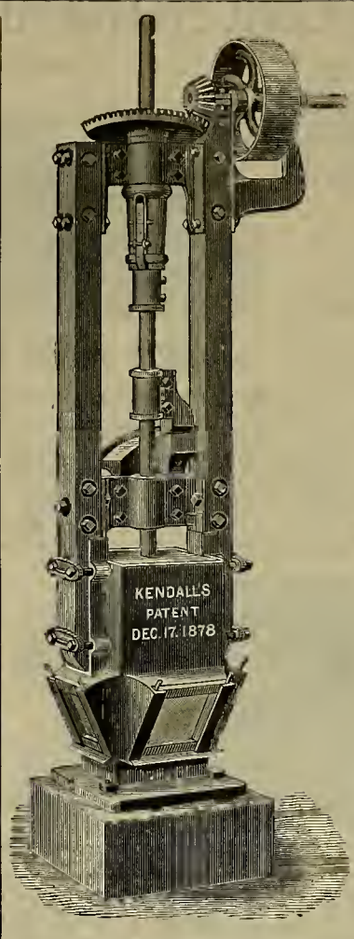

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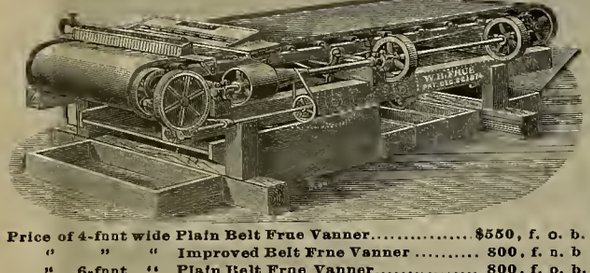


GLADSTONE MINING COMPANY, C. J. Clark, M. E. Gen'l. Supt. FRENCH GULCH, Calaveras Co., Cal., Dec 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small tomention. In order to give an idea of the work they are doing here I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

Price of 4-foot wide Plain Belt Frue Vanner..... $550, f. o. b.
" " " Improved Belt Frue Vanner ..... 800, f. o. b
" 6-foot " Plain Belt Frue Vanner..... 800, f. o. b.

For any information, or for pamphlets, or for circulars or testimonials, call on or address

H. J. SUMMERHAYES, Successor to Adams & Carter, Agent for the FRUE ORE CONCENTRATOR,
No. 132 Market Street. - - San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

(PATENTED.)

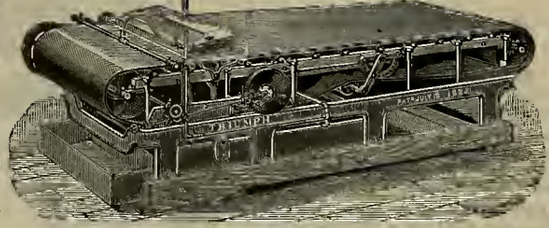
The competitive trials which have been held between the Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coln if used he. Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

Both the "Trinmph" Concentrator and "Blasdel" (riffled) Belt are protected hy incontestable letters patent, granted hy the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, Jr.,

Signed] Sup't North Star and Original Empire Mining Co.

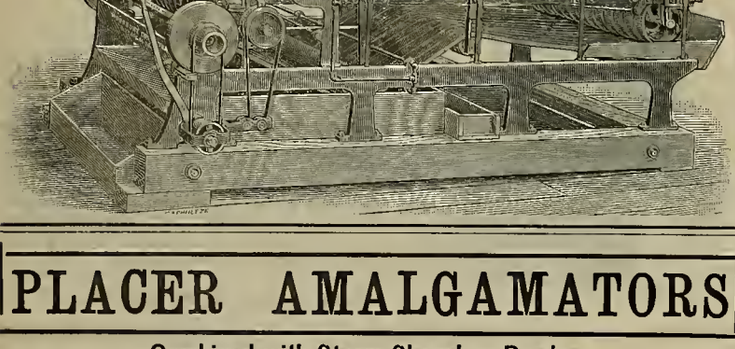
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS

Was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891. MORE THAN DOUBLE THE CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of Best Steel and Wrought Iron. Strong and Durable.

PRICE, $675. f. o. b.

Send for Catalogue and Testimonials. The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge.



THE SAN JACINTO ESTATE—Office of the General Manager. OJAICO, Oct. 30 1891.

GEO. E. WOODBURY, ESQ.—Dear Sir: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" Concentrator placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the concentrates equally clean, as from either of the machines at work here

[Copy] Yours faithfully, S. HARRIS, Manager.

THE SAN JACINTO ESTATE, LIMITED—Office of General Representative, P. O. address, South Riverside, San Bernardino County.

OAJALCO, February 17th, 1892.

GEO. E. WOODBURY:—Your letter of inquiry about your concentrator came to hand in due course. Your machine is doing well, the motion is all right, and the machine is giving entire satisfaction. Yours faithfully S. HARRIS.

PATENTED Aug. 19, 1890.

GEO. E. WOODBURY, Man'f'r, 213 to 219 First St., San Francisco.

PLACER AMALGAMATORS

Combined with Steam Shovel or Dredge.

BUCYRUS SYSTEM.

NEW METHOD OF PLACER MINING.

Saves all the Gold. Uses very little Water. Treats large quantities at Low Cost.

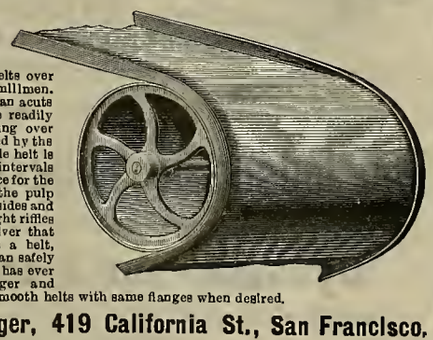
—BUILT SOLELY BY THE —

BUCYRUS STEAM SHOVEL AND DREDGE COMPANY,
BUCYRUS, OHIO, U. S. A.

THE BLASDEL CONCENTRATING BELT COMPANY.

We are now having our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over *any others* will be readily seen by practical millmen.

First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt, the surface of which is entirely smooth. We can safely say that it is a better concentrator belt than has ever been manufactured. It will last much longer and will handle more pulp. We also manufacture smooth belts with same flanges when desired.



H. G. BLASDEL, Jr., Manager, 419 California St., San Francisco.

DEWEY & CO. {220 MARKET ST., S. F. Elevator, 12 Front.} PATENT AGENTS.

FRISBEE-LUCOP MILL CO.,

—MANUFACTURERS OF—

Centrifugal Roller Steel Mills,

FOR PULVERIZING ORES, WET OR DRY,

For Amalgamation or Concentration, and for Manufacture of Cement, Fertilizers, Paint and all other purposes for which grinding or pulverizing is required.

Send for Catalogue and Price List to

FRISBEE-LUCOP MILL CO.,
145 BROADWAY, NEW YORK.

ATLAS IRON WORKS,

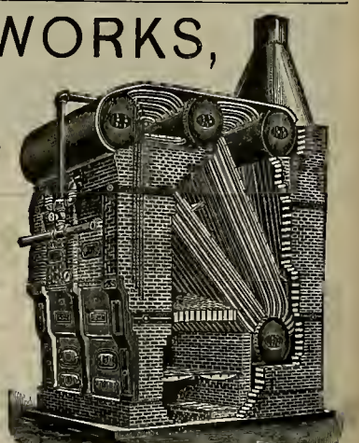
POTRERO, SAN FRANCISCO, CAL.,

BUILDERS OF

Mill, Mining, Street Railway AND Dredging Machinery,

PACIFIC COAST AGENTS FOR THE

Sterling Water Tube Safety Boiler,



Safest, Most Economical and Durable Boiler in the Market. Specially Adapted to Mining Purposes—Being Easily Transported over Mountain Roads.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

TO WORK AN OLD MINE.—Amador *Dispatch*, Nov. 26: J. W. Marshal is reopening the Marklee mine, four miles above Volcano. He is now clearing out and timbering the shaft preparatory to working the mine on an extensive scale. The rock looks fine, and the prospects generally are flattering. There are four ledges, and one of them is over 40 feet wide, while the others are from 4 to 5 feet. The mine was worked some 20 years ago, and the ore proved very rich. There is a good mill on the property. J. W. Marshal and N. V. Hatch, of Sacramento, are the owners of the mine. A large amount of ore is on the dump, estimated at 50,000 tons, which, it is thought, will yield per ton from $5 upward.

ZEILE.—*Ledger*, Nov. 26: At this mine extensive repairing is in progress. The old pipe that supplies the mill is to be taken out and replaced with new. It is nearly half a mile long. The pipe was made in San Francisco, at the Risdon Iron Works, and the first load arrived last week. The mill is also undergoing repairs.

CLINTON CONSOLIDATED.—An assessment of five cents per share has been levied by this company—the first levy since the company's organization. There are 100,000 shares, so that, assuming that all the stock has been placed, the assessment will yield $5000. At the mine, matters have been moving along rather slowly of late. The mill is now running, after several weeks' idleness, necessitated, it is said, by lack of water. The men were paid for one month's wages this week, on account. J. B. Francis, the superintendent, and W. J. Nettle, the foreman, have left the company's employ, and rumor says they will accept positions at the Volunteer. A gentleman named Rogers, from San Francisco, has taken charge as superintendent of the Clinton Con.

KENNEDY.—This mine—the richest in the State—is looking better than ever before. The ore in sight is said to be sufficient to run the mill for three years at least. The mine is developing mainly in a northerly direction, which is also an encouraging circumstance, as the ground embraced in the claim is mostly north of the shafts. We may expect, if the developments north continue flattering, that some steps will be taken to reopen the old Oceida, which is the adjoining claim on the north, and which has never been prospected toward its southern boundary.

MISCELLANEOUS.—At the Tripp mine, on the Mokelumne river, above Big Bar bridge, some fine-looking quartz is being taken from the lower tunnel. Ore is also being extracted from the upper tunnel, where the $8000 pocket was discovered two or three years back. It is hoped to start crushing shortly. Operations on a small scale are in progress at the Volunteer. Two or three men are at work repairing the shaft, the timbers of which are found to be utterly worthless. Messrs. Emery and Doble, who are heavy stockholders in the Blue Lakes Water Co., are reported to have purchased a controlling interest in the Keystone Consolidated mine of Amador City. There are 10,000 shares in the corporation, and the new owners are said to have secured the McDonald interest, or four-fifths of the property. The mine is expected to run as usual. Indeed, the owners in the ditch company are in a better position to run it at a profit than the old company, on account of owning the water supply. Six men are at work on the Astoria, near Middle Bar, running a prospecting tunnel. Rumor has it that there is considerable in the treasury—$10,000—with which to do prospecting. By the judicious expenditure of that amount, it is hoped to make a good showing as to the value of the property. At any rate, we are glad to note the inauguration of mining in earnest in the group of mines owned by a syndicate in New York and San Francisco. It is only by active mining that this county expects to be benefited; the mere dabbling in stocks in New York counts for nothing to the people of Amador.

Calaveras.

MURPHYS.—Calaveras *Citizen*, Nov. 26: Mining interests everywhere around Murphys are looking splendidly. The Beatrice is developing work in a thorough and workmanlike manner, and it will not be many days before the splendid new mill upon San Domingo will be running in full blast. The ore taken from the several tunnels looks well and is profuse in mineral, which, if it can be properly worked, will undoubtedly prove a great enterprise. The company intends, and in fact already has upon the ground an electric dynamo which will be used in the reduction and working of the ores. From this dynamo will also be run wires, which will furnish 15 electric lights that will be distributed in the lighting-up of the mill, office and building around the mine. All in all, this plant will be one of the best in the county. The Norfolk mine, east of town, is starting up under more extensive systems, and it is reported they are now upon the great river channel of the place that is immensely rich wherever it is found in this section. An inquiry into the proceedings of the mine will be made, and a more thorough explanation of its workings will be given to you readers before long. Mr. Morse, the able superintendent of the plant and mine, is an enthusiastic worker, and by his indomitable will and push has done much toward developing not one, but many of the mines in and around Murphys.

Inyo.

CERRO GORDO.—Inyo *Independent*, Nov. 24: W. Crapo is reported to have struck a promising body of silver-lead ore in his mine at Cerro Gordo. The ore was reached but a few days ago, and the extent of the body is not yet known. Mr. Crapo has worked a long time to reach this ore, and deserves that his faith and patience should be richly rewarded.

San Bernardino.

TIN.—*Chronicle*, Dec. 1: The stockholders of the San Jacinto Tin Mine Co. have voted to increase the capital stock to £550,000, the new issue being 200,000 shares at 5 shillings each. The expert, Mr. Yarcoe, made a lengthy report, upon which the foregoing action was taken, and in which were the following statements: "The vein has not been lost, only the workers have reached the bottom of the deposit of ore. The lode in which the tin is found is a true fissure vein, and, according to all experience, there is no reason a second deposit of tin should not be found in depth—indeed, I think it will, but as the mine stands at present there is very little ore in sight. The formation is the same as in other places where the deposits have been found. I should think another 20 fathoms would prove the mine, but there is no absolute rule. About £10,000 would be sufficient for sinking and driving. I should drive westerly for choice, because I think most of the ground in that direction, but I should also drive easterly. I have no fault to find with the quality of the tin. I had no previous connection with the mine and was there about ten days. You cannot test a vertical vein satisfactorily with a drill. You may be near a large quantity of tin and yet miss it. I would propose to drive 150 fathoms and sink 120 feet."

Shasta.

BUNKER HILL.—Shasta *Courier*, Nov. 26: The Bunker Hill mine, situated two miles southeast of Shasta and just north of the Middle Creek depot, and owned by Mrs. James Long, now residing in New York City, John V. Scott and Daniel Lynch, of this place, and Mrs. Carmichael, a daughter of the late D. D. Harrill, has changed hands, W. A. Prior agent for Mrs. Long, having consummated all necessary negotiations, and this week the property was transferred to Wm. M. Murray and others. The ground has not been worked for over 20 years, with the exception of some little prospecting. The parties who have now taken hold of the property intend to work it on an extensive scale, and are confident of opening it out as extensively and rich as it had proved in former years. The balance of the claims on the adjoining 40 acres of the patented ground are owned by Mrs. P. Pryor, Mrs. John Hoy, Robt. Kennedy, Wm. Daniel, Peter Cusick and others.

NOTES.—It is reported that another rich strike was made in the Cleveland mine on Salt creek this week. A new roaster has recently been completed at the South Fork reduction works, and we understand that operations will be begun there about the 8th of next month. Parties below are negotiating with James Dawe for the purchase of his mining property near Shasta. The ledge is a good one, and shows up rich in gold and sulphurets, and would prove a bonanza to some man who had capital to work it. It is rumored that a very rich strike has been made in the Bunker Hill mine, recently sold to Wm. Murray and others. Such a thing would not be surprising, for few if any mining localities in the State ever paid as rich as Bunker Hill did in its palmy days, when every panful of pay dirt contained a small fortune. The mine has been tied up by litigation part of the time, but the indications are now favorable for a general reopening and working of the Hill. Though the property was transferred to parties here, we understand that a company of foreign capitalists will take the mine and work it on an extensive scale. The McDaniel mine, between Salt creek and Lower springs, which was recently sold to S. H. Stewart, of Redding, and a couple of other parties, is panning out big. The ledge is two feet wide and some rich ore is being taken out. M. Simoni, of the Gem mine, is in about 175 feet on the tunnel he is running from the bed of Middle creek. He proposes to run into the hill 800 feet.

Sierra.

GOLD BLUFF QUARTZ MINE.—*Mt. Messenger*, Nov. 26: In a recent issue we mentioned that Wm. Kraft, superintendent of the Gold Bluff quartz mine, had returned from San Francisco, where he contracted for the iron work and machinery for a 20-stamp mill with all the most approved facilities for reducing quartz and saving gold, to be erected at the mine. It is clearly evident that the Gold Bluff Mining Co. has begun work in earnest. The Gold Bluff mine is a good one and the general belief is that Mr. Kraft will make it a profitable enterprise. The Gold Bluff Mining Co. is composed of New York capitalists and mining men. We are authorized by Mr. Kraft to state that all his business transactions will be conducted strictly on a cash basis.

FOREST CITY.—Twenty-five men are working at the Bald Mt. Extension drift mine. The main tunnel, from the mouth of the face northeast, is 6600 feet; to the face south, 6100 feet. Only a day shift is being worked, which has been proved most advantageous for profitable working of the mine. On completion of the incline down south, the working force will be increased. Winter supplies have been laid in and everything is in good order for winter.

GOLD BLUFF.—*Mt. Messenger*, Nov. 18: Oscar Stroud is hauling lumber from Shaugnessy's, and Put Carter from Cole & King's mills for the Gold Bluff mill. We understand that Benj. Pauly has a contract for some 36,000 feet. In a few days carpenters will be at work putting in a four-foot flume for power and laying the foundation for the mill.

WILLIAM TELL.—The tunnel in the William Tell mine, near Sierra City, reached the ledge last week. There is a heavy body of quartz with smooth walls. The tunnel taps the vein some distance west of the pay chute. Rock from the tunnel above paid $12.50 a ton. This lower tunnel gives about 560 feet of ledge above it.

Siskiyou.

GOLD.—Yreka *Journal*, Nov. 30: Another rich discovery has been added to the recent gold finds of Siskiyou. Frank Hall, a young mining engineer of San Francisco, who has been operating on Scott river, below Quartz valley, in search of the ancient deep river bed, bottomed the channel a few days ago. Very rich gravel was discovered, and the bedrock found to be exceedingly rich. Many have believed in the existence of a pay channel in Scott river, and this discovery will induce others to prospect for the channel farther down the stream, where many good-paying drift mines will undoubtedly be found. The Ashland *Record* says Joe Weininger was at that place last week from Rummell Bros.' claim at Klamath river, near Henley, in this county, and reported the boys working on the last pit. Several blasts were made to loosen up the dirt, which was so rich that gold could be seen in the gravel at night with lights. After this pit is worked they will immediately commence the construction of a new wing-dam if the high water does not prevent. Schroeder & Werner of the Deadwood quartz mine, intend shutting down the mill in a few days more, on account of snow rendering surface work difficult. They will still continue to take out quartz from the tunnel, so as to have a large supply on hand to run the mill day and night when spring opens. This claim continues to pay well, and is one of the most valuable mines on the coast. The miners in the high gulch diggings will be enabled to do some mining from now on, whenever the weather is not too cold or stormy, as there is snow enough on the mountain summits to supply plenty of water during the warm portion of the day, or when a warm rain occurs.

Trinity.

THE NEW RIVER MINES.—Blue Lake *Advocate*, Nov. 18: George W. Gabeler, who has charge of Mr. Brizard's store at Francis, reached Blue Lake Friday evening of last week on his way to the bay. Mr. Gabeler brought with him some specimens of copper ore taken from what is known as the Lewis ledge. This ledge is situated on the east fork of New river, eight miles from Francis and ten from New River camp. The specimens shown us are said to assay, of gold per ton, $10 and of silver $20, and to be 23 per cent copper. Mr. Gabeler owns an interest in the mine and feels he ought to be glad of it. The serious obstacle in the working of the claim is the outlay of money that would be involved. A smelter would be a necessity, and other items of expense nowise inconsiderable might be enumerated. New River camp is quiet—very quiet. About 50 men are there, and the Sherwood mine is the only claim that is running, but this is paying very well. What ore is taken from the Sherwood is rich, yet the ledge is small, being usually from 7 to 14 inches in width, though sometimes it grows much narrower and occasionally becomes so small as to reach the vanishing-point. The Colgrove and the Mountain Boomer mines have been running. Not a little mining has been done this fall in the bed of New river, and the results have been in the highest degree satisfactory. Of course the ground had been worked over before, but occasional slides into the stream seem to have made the gravel of the river rich in fine gold. An unwelcome rainstorm three weeks ago, that swelled New river and took away the wingdams, put a veto on further operations this year, but it is expected that work will be resumed in the spring. The miners are kicking themselves for their stupidity in not discovering long ago what a good thing there is in the New river gravel beds. Then there is Pony creek. Considerable attention will be hereafter paid to gravel-mining on that stream. Six claims have been taken up by as many mining men, who have everything in readiness for commencement of work. Only water is lacking, it seems, to fill their pockets with gold and their hearts with joy. All the Pony creek gold is in the shape of nuggets. Numbers of them have been taken out that contained $10, $15, $20 and $25 in gold respectively, and one nugget was worth $65. Mr. Gabeler tells us that it is rather lonesome at the store, but some parties from Eel River valley expect to do considerable mining this coming season on the bar only a few rods away, so he expects matters to assume a more lively aspect in his immediate vicinity. New River camp has already been treated to its first snowstorm.

Tuolumne.

MINES AT QUARTZ MOUNTAIN.—Sonora *Democrat*, Nov. 26: Mining properties around Quartz Mountain are looking exceedingly well. We are informed that the Jumper mine is about to be bonded to San Francisco capitalists. The mine is owned by R. B. Cornwall and Edward Fischer of San Francisco, and is believed to be a valuable property. The Golden Rule mine, situated near the Jumper, is being worked by Oakdale parties and is looking very promising. The App and Heslep mines are being relieved of water, preparatory to the commencement of active operations. These mines are bonded to Napa parties, and their value has long since been demonstrated. That golden treasure, the Dutch mine, still causes its owners to wear a happy smile.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Chronicle*, Nov. 26: There has been extracted from all parts of the mine during the week 963 480-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $30.70 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $29.90 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $16,946.76.

OPHIR.—1465 level—An upraise started on the sill floor, on the north side of the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 feet below the sill floor of this level, has been carried up 14 feet; have extracted therefrom and raised to the surface 11 tons of ore, the average assay value of which is $31.50 per ton. The Mexican mill is now working the ore, which we commenced shipping on the 23d inst. from the ore-house, in which some 400 tons had been accumulated during the past few months.

MEXICAN.—On the 1465 level the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 23 feet; total length, 326 feet; continuing in a porphyry formation with lines of low-grade quartz.

UNION CON.—900 level: The joint Unioo Con. and Sierra Nevada west drift, has been extended during the week 27 feet; total length west from the joint shaft, 2664 feet. The face is in soft porphyry.

SIERRA NEVADA.—East crosscut No. 2, from Kenosha tunnel, started from north drift, 800 feet in, has been advanced 26 feet; total length, 387 feet; face in porphyry. The joint Sierra Nevada and Union west drift, 900 level, has been advanced during the week 27 feet, making the total distance west of shaft, 2664 feet; face in soft porphyry.

CHOLLAR.—Are retimbering upraise from 350 to 250 level. The repairs to the main shaft between the 930 and 850 levels are not yet completed. The east crosscut, 160 feet south of north line, 930 level, is out 236 feet; face in porphyry. In the east crosscut from the north lateral drift have started a drift north which is following a streak of clay and quartz.

POTOSI.—The repairs to the Ward shaft have been nearly completed and the pump column laid through the northwest drift from the Ward shaft, 1800 level, up through the Potosi winze, to the 1500 level, and pump put in place at the Ward shaft ready to pump the water to the 1500 level of the Potosi. Extracted and sent to the mill the past week 553 tons 700 pounds of ore from the 550, 930, 1100 and 1500 levels. Milled during the week 630 tons. On hand at mill, 100 tons, 600 pounds. Average battery assay, $26.45. Shipped to the Carson Mint, 399 pounds of crude bullion.

BULLION.—Have started a north drift from west crosscut, 100 feet north of top of raise above east crosscut, 320 feet south of north line, 1300 level; face in porphyry and low grade quartz. The repairs to the Ward shaft have been nearly completed.

WARD SHAFT.—The repairs to the shaft have been nearly completed, and the pump column has been laid through the northwest drift from the 1800 station, up through the Potosi winze to the 1500 level, and pumps put in place at the shaft ready to pump the water to the 1500 level of the Potosi.

EXCHEQUER.—The repairs to the Ward shaft have been nearly completed, and the pump column has been laid through the northwest drift from Ward shaft, 1800 level, and up through the Potosi winze to the 1500 level, and the pump put in place at the Ward shaft ready to pump the water to the 1500 level of Potosi.

ALPHA.—The repairs to the Ward shaft have been nearly completed, and the pump column has been laid through the northwest drift from the Ward shaft, 1800 level, and up through the Potosi winze to the 1500 level, and pumps put in place in the Ward shaft ready to pump the water to the 1500 level of Potosi.

NEW YORK.—The winze on the 650 level is down 75 feet on the slope; bottom in quartz of low assay value. A drift has been started south from the bottom of the winze; the face is in quartz yielding fair assays; 110 tons of ore have been shipped to the Washoe mill for a milling test, but owing to the breaking of the main shaft of the mill the test will not be completed for four or five days. Are taking out from the stope above the 650 level from 10 to 12 cars of ore per day, car samples assaying from $35 to $40 per ton.

SILVER HILL.—The north drift on the 160 level has been advanced 10 feet during the week through quartz, car samples of which assay $7—nearly all gold.

BEST & BELCHER.—200 level—On this level we have taken charge of the Gould & Curry northwest drift, which was advanced by them to our south boundary line, and have extended same 20 feet during the past week; face of drift is in soft porphyry and bunches of quartz. All work on the 900 level during the week has been retimbering and on repairs.

GOULD & CURRY.—200 level — West crosscut No. 5, started 432 feet from main west drift, has been advanced 18 feet through hard porphyry; total length, 121 feet. At a point in main north drift, 332 feet from west crosscut No. 3, started west crosscut No. 6 and extended same 12 feet; face in soft porphyry.

HALE & NORCROSS.—We continue retimbering main shaft at the 800 level. During the week the west drift on the 150 level of the old or A-street workings was extended 12 feet, making its total length 84 feet; face in porphyry, with some streaks of quartz.

ANNEX.—On 420 level north drift from east crosscut north, advanced 16 feet; total, 63 feet; formation, porphyry and clay. With this drift we have made an important connection that gives us a good circulation of air. No work done in the mine on the 24th.

Ferguson District.

THE COMING GREAT CAMP.—Cor. Pioche *Record*, Nov. 18: The winter of our discontent, the doubts that lingered about the camp, have passed, and we again reiterate our oft-repeated assertions that "Ferguson must be considered a factor in Lincoln county and the State of Nevada." And to prove this we will give a few items that we have from the very best of authority, that we think will show that Nature has enriched this camp with a lavish hand. The Magnolia, we are assured, is now turning

ont over $2000 per day. The April Fool has gone back to its original owners, hut we have been assnred that it is not because of any lack of value in the mine, but that it is now as rich as it ever was. The cause is found in a disagreement among those who hought it. The claim of Messrs. Gilhert and Frenchy has lately shown ore that is nearly pure eilver, with a large share of gold, and it is said to he ahnndant. The claims of Messrs. Pierson & Co., near the April Fool, are highly satisfactory to the owners, showing some of the finest of specimens, and only need development. The Reed tnnnel is progressing finely, is now more than 300 feet in length, and several ledges have heen passed, and it now promises more than ever. To speak of all the mines here that promise well would reqnire more space than you would want to devote to this place at one time. Our little town of Helene is hooming, and reminds the writer of Denver city in 1858. The question of water has heen a serious one, but is fast heing solved. Three different places are heing developed and many more prospecting for water. The initial work of digging a ditch to pipe water from the well helonging to Messrs. Garrett, Chandler, Smith & Lowry to Helene, we saw to-day, and were assured that it would soon be running into the future capital of Lincoln county. To say that our camp and town are booming is putting it very mild, and the oft-repeated phrase of last summer, "If the camp holds out," is now but seldom heard, and then spoken only by croakers. We are a fixed institution, and will be heard from in the distant futnre as one of the rich camps of the great mineral West.

Ploche District.

YUBA.—Pioche *Record*, Nov. 18: The working force at the Yuha mine has been reduced to four men. The main work is to connect the 1300-level west drift with the workings of the old Mazeppa or Meadow Valley No. 3 and thus secure thorough ventilation with the Yuha shaft, withont which the shaft requires constant attention to keep it open. The watchman at the smelter is now monarch of all he surveys, being the only resident of the place. Messrs. Scholfield and Spillman are pegging away on their Old Timer claim, southwest of town, and expect to reach the ledge in a few days.

Tuscarora District.

NAVAJO.—*Times-Review*, Nov. 26: The stopes above the 350-foot level are without material change.

BELLE ISLE.—The stopes ahove the 250-foot level are looking a little better.

NORTH BELLE ISLE.—No. 1 upraise, south 300-foot level, extended 15 feet, still yielding bunches of good ore. South intermediate, above the sonth 400-foot level, extended 5 feet, etill showing a good vein of pay ore in the face. The stopes are looking about the same. Have etarted to do the assessment work on the outside claims.

ELKO CON.—Have started to do the assessment work in a drift north from the old incline.

INNEFENDENCE.—A crosscut has heen started east from the bottom of the north prospect ahaft.

Ruby Hill District.

THE GRIZZLY MINE.—Salt Lake *Journal*, Nov. 23: This company, recently organized to pnrchase and operate the Grizzly property in Ruby Hill district, Nevada, paid the entire pnrchase price—$40,000—to W. B. Lawler, the owner. The company, which is composed of Isaac Jennings, J. R. Sharp, L. G. Hardy, A. E. Hyde, John Beck, A. M. Cannon, J. M. Fox Jr., D. W. James and J. E. Jennings, is capitalized at a million dollars, and is incorporated as the Grizzly Mining Co. A. E. Hyde, J. M. Fox Jr., and others of the company leave for the mine to-day. H. A. Mears, of Denver, Col., one of the hest mining men in the West, and whose personal character makes friends of all with whom he comes in contact, has accepted the snperintendency of the property, and under his efficient management it will douhtless develop into one of the great mines of Nevada.

BRITISH COLUMBIA.

SILVER MINES.—Tacoma *News*, Nov. 28: The discovery of silver in what is known as the Kaslo and Dnncan districts in British Columhia, is receiving a great deal of attention just now. If reports received in this city from men who have prospected on the other side of the boundary line in the new country he true, there is promise of a real bona fide mining excitement hefore spring sets in next year. The Kaslo district is about 150 miles from the Kootenay district. American prospectors flocked there early this year and they have been more than repaid for their efforts. Upwards of 200 claims have heen staked out. Improvements are being made on a great many of the claims and some of them are already being worked. When prospectors flooded the Kaslo district this summer, some of them went farther off into the conntry and another immense ledge of silver was etruck. A mining camp was also quickly formed there, and it has since been christened the Duncan district. The ore in both districts is sprinkled with gold, but not to any particular extent. Assaya that have heen taken show the ore to run from 508 to 542 ozs. of silver and from 40 to 50 per cent of lead to the ton. Without exception, the ore has been of a high grade.

EAST KOOTENAY.—Nelson *Miner*, Nov. 12: East Kootenay is confidently expecting a rush to Wild Horse creek and vicinity next year, and, from all accounts, recent discoveries and developments justify them in helieving that more interest will be taken in this country than has for the past 20 or 30 years been the case. Of course, it is not expected that the scenes of 1860–64, when flonr was $100 a sack and no one cared to work for much less than $100 a day, will he reenacted, but certainly it would seem that gold-washing by hydraulics will be carried on to a considerable extent during the coming year, as we understand that a syndicate bas bought, from Dave Griffiths, his placer claim on Wild Horse creek for $100,000, and intends to start taking out the gold as soon as tbe weather will permit. That they will he succeseful in their operations may he inferred from the fact that five Chinamen, working close to this claim, in four months cleaned up $2000 each. A strike of galena has recently been msde, the discoverer claiming (and his claims seem to be borne out by expert evidence) to have 22 feet solid ore, running 40 oz. silver to the ton, and 60 per cent lead. The total width of the lead is 32 feet, and the true walls have not yet heen found. The ore is a fine-grain galena, and the formation is gritty limestone. Woods Bros. of Winnepeg have bonded this claim for $40,000 and are now einking a shaft in the carbonates alongside the ore. The mine is in a most favorable position, looked at from a working point of view, as it is possible to drive from Fort Steele to within three miles of the lead, and it is estimated that it would cost ahout $500 to huild a wagon road from the mine to a shipping point on the Kootenay river. Eighteen prospectors have been in the district during the past snmmer, and every one of them has made a location and intends to return next year. There can be no douht that, had it not heen for the fact that the attention of mining men has been given almost exclnsively to the Slocan, the Wild Horse district would have attracted, this year, that interest from which it hopes to derive considerable benefit in the near future.

NEW MEXICO.

LONE MOUNTAIN.—Silver City *Enterprise*. Nov. 25: The ore body exposed on the Mayflower and Ruby King mines is something wonderful. An *Enterprise* representative, having heard the almost incredible stories ahont the property, drove to the mine on Tuesday to ohtain the facts by personal observation. It is little wonder that the stories told in regard to the ore body are hard to be helieved, for one acquainted and familiar with practical mining and accustomed to mining on large ore hodies will be unable to helieve the evidence of his own senses on first view of this enormous deposit of ore. The ore body is in a basin, a limestone plateau or table land ahout one mile south of Lone Mountain. It lies adjacent to a porphyry dyke, from which it in all probahility emanated. Its extent, so far as explored, is 700 feet hy 400 feet in width. The exploration is hy means of shafts, drifts and open cuts. Two shafts sunk on the east have attained a depth of 65 feet, all in ore from top to hottom; drifts run from east 50 feet to west show the same uniform ore body without hreak or fault. To the northwest and 200 feet west of the northeast shaft, an open cut 20 feet in depth and 150 feet long by 60 feet wide shows an ore body from 18 to 20 feet deep on sides. The ore is simply being quarried out of this opening. Men are employed with horses and carts hauling off the couple of feet of debris which covers the surface of the ore body and then the whole mass is heing quarried and shipped to the mill. The open cut is heing extended in every direction and heing worked upon all sides, yet there seems to be no limit or boundary to the ore body in any direction. The gangue of the ore body is a quartose rock with occasional bodies of talcose rock. The ore appears to be practically a free-milling rock, showing horn silver plentifully sprinkled throughout. Some of the talcose ores are literally coated with horn silver, some of the sides of these specimens showing hut little of the rock exposed from beneath the covering of silver chloride. Such samples would run away up in the thousands. The general average of all the openings made upon the ore assays from 18 to 25 ounces of silver per ton. It is without douht the greatest ore body developed in this country during the past ten years. Counting the ore body on the limit or extent to whicb it is at present explored—that is, 700 by 400 feet, with a depth of from 18 to 65 feet—and allowing 14 cubic feet per ton, the amount of ore so far is 861,580 tons. A ten-stamp mill is pounding merrily away on the mill site half a mile from the mine, hut it seems to be an insignificant piece of machinery when compared with the job it has undertaken, to reduce the ore from this gigantic mine. The ores exposed would justify the erection of a 50-stamp mill and if some positive and permanent price he passed upon silver there is little douht that 50 stamps will be at work upon this mine within two years.

PACIFIC.—*Southwest Sentinel*, Nov. 26: The Pacific Gold Company is treating ahout 44 tons of ore a day in the Mountain Key mill, at Pinos Altos. The Pacific mill here will not be started up for the present, because some of the machinery which was taken out and put into the Mountain Key mill would have to he replaced before the mill could be started. The Silver City Water Company can supply the Pacific mill with water whenever the company is ready to start it again. The capacity of the Pacific mill is ahout 90 tons of ore a day, but the mine can produce enough ore to keep both mills running. There are hetween 40 and 50 men at work in the placers at Pinos Altos. The supply of water is not so large as it usually is at this season of the year, and there are not so many men at work as there would he if water was plenty. The Brockman mill, at Lone Monntain, has been closed down for a few days, hut was to have started up again yesterday. It was reported that too much silver was being lost in the tailings. The Brockman mine is looking hetter than ever hefore, and the expense of mining is small. The ledge is nearly 40 feet wide, and the ore runs nearly $20 per ton in silver. There is a good prospect that the alum beds on the Gila river will be opened in the near future. A railroad is heing talked of to the Gila, which will enahle the owners of these mines to operate them on a large scale.

UTAH.

THE CRESCENT DRAIN TUNNEL.—Park City *Record*, Nov. 19: The writer was informed this week that the Crescent Co. had decided to drive the big drain tunnel which will tap its vein at a depth of 1800 feet helow the collar of the hig incline shaft, and that as eoon as Manager McGregor, who is just recovering from a severe spell of sickness, was ahle to get abont, operations would he commenced. Inqniry at the Park City office resulted in an unofficial confirmation of the rumor. Mr. Hinsdill said that while no official action had heen taken it was tacitly understood among the directors that the tnnnel would be driven and tbat it shonld start at the point selected two years ago by a careful survey. Mr. Hinsdill eaid that the work might not he commenced immediately, as there were a number of preliminaries to go through, but that it would not be long before gronnd was hroken, aud, when it was, work wonld be prosecnted without interruption until the enterprise was completed. The site chosen for the starting of the tunnel is in the first hig curve above the old trestle in "Nigger Holler," and below the tramway, being a most convenient point. The tnnnel will cut through a large scope of conntry that has really never been prospected to any depth and which is classed as mineral-bearing grouud hy all men who claim to he posted. If the tunnel is run, and there is little doubt that it will be, it should uncover some very rich mineral veins.

A PROMISING STRIKE.—A strike was made in the Black Diamond mine recently that promises to develop iuto something big for the boys who have a lease upon that property. The *Record* was shown some very rich rock Thursday last, rock that will run np in the thonsands of ounces, and was told that Messrs. Loofhorongh, Snyder and Sharp, the leasers, had 12 inches of the same kind of etuff and would soon have a carload ready for shipment. Mr. Sharp was interviewed and said that while some very rich ore had been fonnd in bunchee, and that while the vein they were working looked very promising, the extent of its richness could not he told for perhaps ten days yet. The ore is really very fine and a six-inch streak of it would make them all rich in less than a year. Tbeir lease covers the Black Diamond and Nemrod claims, owned hy C. Hirschman, thongh only the former is being worked.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Dec. 1, 1892.

Trade the past week has heen interrupted hy heavy storms. While business has heen temporarily interrupted, yet the generous and well-distributed rains in the valleys and uplands and heavy deposits of snow on the mountain ranges give encouragement of more active times in the near future. The past two dry winters had left the ground in nearly all the agricultural sections of the State sadly in need of a good soaking to insure large crops, while the absence of heavy deposits of snow on the mountain ranges gave only a partial season to miners in many of the mining districts. With the foundation well laid for good crops, and also for an ahundant supply of water, the farming and mining industries ought to he more prosperous in 1893 than for all of three years. It is hardly to he expected that we will witness much of a revival in business until after the turn of the year, owing to it heing too near stock-taking and annual settlement time.

The local money market is reported essentially unchanged. The destructive storms in last week did great damage throughout the State, which will call for the expenditure of large sums of money. These disbursements will soon find their way hack to the general financial reservoir. The rains, it is said, are already creating a feeling of confidence, and, with confidence restored, money will seek investment and many languishing industries he placed on a more substantial and profitable footing, besides bringing out new enterprises, which, in the hands of proper persons, would prove valuable investments. The disbursements in last month, in dividends, aggregate $367,175 against $379,325 in the corresponding month in 1891. The falling off was in powder, insurance and companies coming under the head of miscellaneous, and the increase came from mining companies.

Eastern mail advices continue to report a most encouraging outlook for general business, although trade would in this month he largely confined to holiday goods. After the annual settlements a liheral demand is expected to set in from the southern States, owing to hetter prices for cotton and a promising prospect for other products at the South. This Southern huying will he followed later on hy free huying from the central States. The various manufacturing industries at the East, as a rule, report a fair degree of activity, with many reporting orders ahead. An advance in the price of cotton goods and carpets, and the upward tendency in pig iron and copper, are important features and go far in confirming previous advices that the depression and stagnation in trade circles had seen its worst, and that a steady improvement might reasonably he looked for. In referring to the New York money market a leading exchange of that city says that "the ease in the money market, which has made steady progress of late, has not yet heen disturhed hy the talk ahout gold exports. Despite the continued outflow of currency to the South to move the cotton crop, the New York hanks have heen enahled to increase their cash resources through the liheral pension payments of the General Government and the receipts of money from near-hy cities. This has brought these institutions into the open market, as huyers of commercial paper, the supply of which is only moderate, particularly of desirable kinds. Out-of-town hanks have also heen huyers, and the result is that all merchants in good credit find no difficulty in getting whatever accommodations they need. The mercantile failures throughout the country continue to show a decrease as compare1 with last year, both in regard to number and liahilities. This is encouraging and increases the confidence of hank managers in paper generally. Prime indorsed hills receivahle, running from sixty days to four months, have heen discounted at 5@5½ per cent, and prime and good single names at 5½@6 per cent. The rates for lower grades of paper take a wide range, say from 6½ to 8 per cent."

The International Monetary Conference is attracting more general attention than had heen expected, which goes far in confirming the advanced views of himetallists that the financial situation the world over is considerahly strained, which, without relief, is liable to develop into a colossal panic, such as the world never hefore witnessed. Probahly this had not heen so seriously considered until a Rothschild sounded the keynote in conference which rang out the words of warning. It is to this fear that we can reasonahly hope the conference will arrive at a favorahle conclusion and act intelligently on the situation hy which silver will he rehahilitated and once more hold the position it had. The proceedings of the conference are given in another department.

SILVER—The market has ruled strong, with an advance established. The growth of the market does not indicate a speculative movement, hut a movement grounded on the supply and demand, largely predicated on the prohihle action of the Monetary Conference. Among the hetter informed in this city there is a growing feeling that the conference will disappoint croakers and monometallists and take intelligent action hy which silver will he restored to its former standing. It is also said that as this conference is a pet scheme of the present Administration, that hefore the Fifty-second Congress goes out a hill will he passed and approved conforming to the action or recommendations of the conference. Silver was strong to-day. There was exported the past week in hullion $127,200 to China and $85,000 to Japan.

MEXICAN DOLLARS—The market is strong at around 68 cts. There was exported the past week $207,692 to China and $60,000 to Japan.

QUICKSILVER—The imports the past week aggregate 619 flasks. The market is steady at current quotations.

BORAX—Reported receipts the past week aggregate 486 ctls. The exports hy sea the past week aggregate 3460 ctls to New York. The market is steady.

ANTIMONY—Exports hy the sea the past week aggregated 309 ctls. The market here and at New York is essentially unchanged.

LIME—Receipts the past week aggregate 1727 hhls. Stormy weather interferes with receipts and also with the demand.

PIG LEAD—The market is dull and harely steady. Eastern advices report a soft market, owing to sellers heing more anxious than huyers.

PIG TIN—While our market holds steady, the East is reported weak under manipulation. This manipulation extends to Europe.

PIG IRON—Imports the past week aggregate 590 tons of American. The market is reported steady, with a slightly firmer tone. Eastern advices report quiet hut strong markets. Reports from the English markets are conflicting.

COPPER—The market the past week developed more strength, with an advance estahlished. The improvement is based on large transactions at home and ahroad. *Iron Age* reports the New York market on Nov. 24th as follows: "Freer huying is attrihuted chiefly to statistics of production the world over, showing a considerahle shortage as compared with well-known capacity, and hearing *prima facie* evidence that, while there may he no international combination as alleged, there has heen a curtailment of output the world over that is most remarkable as a mere coincidence. It is only suggestive in this connection that prices have advanced more sharply in the European markets than on this side of the ocean. Toward the close of the week the report had circulation that about 6,000,000 pounds of Lake Superior product, adopted for electrical purposes, had heen sold for delivery during the first half of next year at 12½c per pound.

COAL—Imports the past week aggregate as follows: Swansea 13,065 tons, Sydney 3300, Cardiff 7633, Newcastle (N. S. W.) 1991, Seattle 798, Tacoma 2281, Coos Bay 730, Nanaimo 1566; total, 33,763 tons. Heavy arrivals preceded the present storm, which gave us liheral supplies of foreign. There is a large tonnage loading Australian for this port. Heavy rains throughout the State have inspired a feeling of confidence that we will have a large crop of wheat in 1893, which may cause more vessels to load with coal and head for this port. Our local market is firm, with a free consumption reported.

Eastern Metal Markets.

NEW YORK, Dec. 1.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39⅜	84⅞	11 90	3 75	20 20
Friday	39⅜	84⅞	11 90	3 75	20 20
Saturday	39	85⅛	11 90	3 75	20 15
Monday	39 3-16	85⅛	12 00	3 75	20 15
Tuesday	39 3-16	85⅛	12 10	3 70	19 95
Wednesday	39⅛	85⅝	12 10	3 70	20 00

Quicksilver is steady. Copper is stronger and higher. Lead is weak as is pig tin. Pig iron is steady.

San Francisco Metal and Coal Market.

ANTIMONY.		STEEL.	
Per lb	— @	English, lb	— @ 18
BORAX.		Canton tool	— @ 84
Refined, in car lots	— @ 7½	8/8 Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	6½@ 10
Concentrat'd, do	— @ 6½	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		TINPLATE.	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 5 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @ 11 75
IRON.		PIG TIN.	
Bar, base	— @ 3	Spot	— @ 23
Norway, base	— @ 4½	COAL.	
PIG IRON.		SPOT FROM YARD—PER TON.	
Spot.		Wellington	$8 00
Eglinton, per ton	22 00@—	Greta	7 50
Glengarnock	23 00@—	Nanaimo	6 50
Am. Soft, No. 1	24 00@—	Gilman	6 00
Oregon Pig	—@—	Seattle	6 00
Puget Sound	—@—	Coos Bay	5 50
Clay Lane White	24 00@—	Camuel	8 50
Langloan	22 00@—	Egg, hard	12 00
Thorneliffe	23 00@—	Cumberland, in sacks	15 50
Cartsherrie	22 00@—	Do, bulk	14 00
Barrow	22 00@—	Wallsend	7 25
Carnbroe	22 00@—	Scotch Splint	7 50
CHROME IRON ORE.		Brymbo	7 50
Per ton	0 00 @— —	West Hartley	7 50
LEAD.		TO LOAD—PER TON.	
Pig	— @ 4½	Australian	6 00@— —
Bar	— @ 5½	Liverpool Steam	6 25@— —
Sheet	— @ 7	Scotch Splint	6 25@— —
Pipe	— @ 6½	Cardiff	6 50@— —
SHOT.		Lehigh Lump	15 00@— —
Drop, sizes *smaller* than B, per bag of 25 lbs	$1 85	Cumberland	13 00@— —
Do do, B and *larger* sizes		Egg, hard	11 00@— —
per bag of 25 lbs	2 10	West Hartley	7 00@— —
		COKE.	
Buck, Balls and Chilled		English, to load	$8 00@ 9 00
do, per bag of 25 lbs	2 10	Do, spot, in bulk	—@10 00
QUICKSILVER.		Do, in sacks	—@12 00
Home trade, per flask	41 50 @42 00	Cumberland	9 00@— —
For export	35 50 @36 00		

Mining Share Market.

SAN FRANCISCO, Dec. 1, 1892.

Mining sbares, since Tbanksgiving, have exbibited more vitality tban for sometime past. The presen t upmove appears to be led by Potosi, with Bullion a good second. The taking up of New Yurk to start tbe move, followed by Potosi and Bullion, is looked upon by large outside operators with suspicion. Tbey see in it a bold attempt to saddle the public with shares in tbe mines which are reported to bave been marked for looting. Whether the move will prove a success is, at tbis writing, problematic. That tbe public has not taken kindly to it up till now is witnessed in tbeslow movement, in sympathy, of the lower-priced sbares. Experience has shown that when the public begins to take a hand in tbe game tbe low-priced sbares appreciate. Although tbe public is not in the move, yet it is morally certain that when prices are advanced to better figures, outside buying will again be tbe order, and with the usual result—insiders selling—and, after all is sold that can be, then setbacks until a decline is touched of from 50 to 80 per cent. This decline will not be due to a lack of merit in the mines, but entirely to a withdrawal of inside support. As long as there is large profit in milling ore, insiders care but little for deals except for tbe object of unloading shares for assessment purposes, and it is well for outside dealers to always keep tbis in view.

Experienced miners say that the cry of "if only an ore development can be made" is all rot and only raised for tbe purpose of blinding shareholders to tbe generally accepted correctness of reports that ore developments are only for the mill rings. While this is tbe prevailing opinion with mining men, yet the fact must not be ignored that since Judge Hebbard's decision in the suit of M. W. Fox against tbe late directors of tbe Hale & Norcross Mining Co., there bas been an apparently steady improvement in making out reports by the superintendents of tbe mines, and latterly of the bringing up of tbe battery assays to a nearer level with tbe car sample assays. Not only does there appear to be a dispnsition to act more bonestly, but tbere does not appear to be so much mixing of country rock or low-grade ore for tbe purpose of giving more milling and at the same time reduce tbe bullion output so that assessments are a necessity, when dividends would be declared and paid if bonest or fair management was the order.

Persons accepting a directorship in any incorporated company and who accept an office of trust under the laws of California, become, to a certain extent, public officials and their official acts become public property. As officials they should invite investigations and not shrink from adverse criticism, when, through their actions or inattention to the duties of the office, shareholders in the company are wronged.

The market opened this (Thursday) morning inactive, with Potosi sold at $1.90 and Belcher at $1.70, and Hale & Norcross at $1.55. The other sbares sold at unchanged prices. After Call, shares in the Devil Gate mines developed some strength under the lead of Justice. This improvement caused a movement in Potosi, which sold up to $2.10. The market acts as if the manipulators intend to send prices to a bigher range of values, for unless this is done the gambling public cannot be induced to buy. Already mysterious hints are afloat giving reported improvements and important work to be started soon, but it is not reported that any ore found and taken out will be milled for the benefit of the rings.

Tiue to points put out on the street, the share market began to improve soon after J. L. Flood returned from the East.

News from the Comstock mines is of an encouraging character, which, if the moneyed public had confidence in the management of the mines, would cause sbares to be selling many times bigher than they did to-day. The official letter from Potosi reports that the ore pulped last week nearly $5 a ton less than the car sample assays. The work to the east in the mines, by private advices, is said to be encouraging; but, while promising well, the sbares are only a gamble, for it may develop into something big or it may turn out a failure. Opbir is milling about 400 tons of ore, which bad been accumulated. In Con. Virginia the work going on is about the same as that reported last week. In Hale & Norcross an important west crosscut has been ordered to be started on the 1890-foot level. There is a remarkable absence of information from Cbollar. In Crown Point they bave started a west crosscut on the 400-foot level to run for tbe ore found in Belcher. It will have to run between 120 and 160 feet before they expect to strike the lode. Work in the west crosscut in Sec. Belcher is not pushed. At last advices it was in favorable ground. The official letter from Belcher reports that over 400 tons of ore was milled, which pulped $35 60.

The Carson river is said to be running bankfull, so there is no excuse for any idle mill on the score of lack of water-power

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOV. 22, 1892.

486,692.—HOSE REEL—A. D. Coplin, Oakland, Cal.

486,513.—STATION INDICATOR—W. S. Dillon, Portland, Or.

486,704.—FURNACE—J. S. Ecker, Portland, Or.

486,451.—MEASURING CANISTER—F. Espel, S. F.

486,460.—CAR COUPLING—J. Globig, Spokane, Wash.

486,612.—ELECTRIC RELEASING DEVICE—W. R. Hewitt, S. F.

486,531.—LAZY-TONG GATE—James & Ferguson, Santa Cruz, Cal.

486,719.—RAILWAY SYSTEM—J. P. F. Kuhlmann, Seattle, Wash.

486,728.—HONEY EXTRACTOR—C. W. Metcalf, Santa Paula, Cal.

486,617.—MACHINE FOR FORMING BERRY BASKETS—R. E. Morey, Oakland, Cal.

486,737.—WOODEN VESSEL—E. M. Reese, Santa Paula, Cal.

486,622.—CONCENTRATOR—Jas. Tulloch, Angels, Cal.

486,514.—STATION INDICATOR—W. A. Turner, S. F.

The following brief list by telegraph, for Nov. 29, will appear more complete on receipt of mail advices:

California—Mark Antbony, Berkeley, two patents for faucet and bushing; James S. Brown, Eureka, neck yoke; Joseph Davis, San Francisco, two patents for water filter; John Gambetta and C. D. Harsen, compound rotary engine; Charles H. Gruenhagen, San Francisco, adjustable stand for show windows; Abel Henning, Los Angeles, diaphragm for gas meters; Robert Hewson, San Francisco, rotary motor; Albert McDowell, Selma, refrigerator; Abel Mining, engineering method and apparatus; Henry Timken, San Diego, two patents for vehicle spring.

Washington—Alfred J. Sansen, Waverly, tire-setter and cooler; James Farquharsnn, Tacoma, reversible window; Edwin Vanwart, Port Madison, combination inck.

Arizona—Andrew Knudsen, Tucson, bit-brace.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

MACHINE FOR FORMING BERRY BASKETS.—Roswell F. Morey, Oakland. No. 486,617. Dated Nov. 22, 1892. In the formation of baskets for containing small fruits like berries, cherries, etc., the inventor makes thin veneers of wood which are shaved or otherwise split out from suitable stock, having a length and width sufficient to form the bottom and sides of the basket when two of these veneers are crossed upon each other, and then properly bent into shape, and these veneers are secured in position at the top by a metal clamp which holds the upper edges, thus completing the basket. This new machine is designed to fold the veneers to form the basket and to apply the metal rims thereto after they are folded.

ELECTRIC RELEASING DEVICE.—Wm. R. Hewitt, S. F. No. 486,612. Dated Nov. 22, 1892. The general object of this invention is to provide a simple and effective relessing device for any purpose. It is especially applicable to releasing automatically-hitched animals.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco.

CALIFORNIA GUARANTEE AND IRRIGATION CONSTRUCTION COMPANY (San Diego). Capital stock, $1,000,000. Directors—D. C. Reed, H. T. Christian, George M. Dannais, C. F. Webber and George L. Arnold.

EUREKA COMPANY (San Francisco). Capital stock, $10,000. Directors—Horatio Beveridge, F. W. Spencer, Edward Klau, S. C. Scheeline and A. F. Chambers.

PIONEER DITCH COMPANY (San Jose). Capital stock, $7500. Directors—J. Q. Pearl, J. D. Roberts, Thomas Hardie, G. S. Rawlings and J. L. Mosber.

PRACTICAL TREATISE ON HYDRAULIC MINING.

BY AUG. J. BOWIE, JR.

This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on Heavy Grades methods of mining shallow and deep placers, history and development of mines, records of gold washing, mechanical appliances, such as nozzles, hurdy-gurdys, rockers, undercurrents, etc; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water. Price, $5, post-paid. For Sale by DEWEY PUBLISHING CO., 220 Market St., San Francisco, Cal.

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ASSESSMENTS.

COMPANY AND LOCATION.	No.	AMT.	LEVIED, DELINQ'T AND SALE.	SECRETARY.
Belle Isle M Co, Nev	5	10c	Nov 5, Dec 7, Jan 4	J W Pew, 310 Pine
Bullion M Co, Nevada	40	25c	Nov 21, Dec 24, Jan 25	R R Grayson, 331 Pine
Carra M & M Co	35	5c	Sept 28, Nov 18, Dec 28	C C Coleman, 16 Fremont
Challenge Cons M Co, Nevada	13	25c	Nov 30, Jan 4, Jan 25	C L McCoy, Mills Building
Commonwealth Cons M Co, Nevada	10	10c	Nov 23, Dec 28, Jan 24	R R Grayson, 331 Pine
Con Imperial M Co, Nevada	34	3c	Nov 22, Dec 29, Jan 19	C L McCoy, Mills Building
Cons New York M Co, Nevada	3	10c	Nov 2, Dec 5, Dec 18	C E Elliott, 309 Montgomery
Cons St. Gothard M Co, California	6	5c	Oct 13, Nov 17, Dec 7	T Wetzel, 320 Sansome
El Leopoldo G & S M Co, Mexico	1	10c	Nov 11, Dec 14, Jan 2	Jabez Howes, 130 Sansome
East Best & Belcher M Co, Nevada	3	20c	Nov 23, Dec 29, Jan 18	C H Mason, 324½ Montgomery
Exchequer M Co, Nevada	34	10c	Oct 28, Nov 30, Dec 26	C E Elliott, 309 Montgomery
Golden Fleece Graved M Co, California	18	$3	Oct 10, Nov 16, Dec 7	W J Gleason, Phelan Block
Gould & Curry S M Co, Nevada	70	25c	Nov 22, Dec 28, Jan 20	A K Durbrow, 309 Montgomery
Indian Creek L & M Co, California	3	10c	Nov 4, Dec 14, Jan 6	S C Mills, Mills Bld'g
Justice M Co, Nevada	54	10c	Oct 14, Nov 18 Dec 8	R E Kelley, 419 California
Keyes S M Co, Nevada	5	25c	Nov 2, Dec 6, Dec 27	J H Styre, 328 Montgomery
Louvre Cons G M Co, California	1	5c	Nov 9, Dec 14, Dec 30	J F Hollins, 413 Leidesdorff
Mexican M Co, Nevada	46	25c	Oct 13, Nov 17, Dec 7	C E Elliott, 309 Montgomery
North Belle Isle M Co, Nevada	21	10c	Nov 14, Dec 20, Jan 17	W Pew, 310 Pine
North Gould & Curry M Co, Nevada	14	15c	Nov 21, Dec 24, Jan 16	C H Mason, 324½ Montgomery
Occidental Cons M Co, Nevada	11	25c	Oct 25, Nov 30, Dec 21	A K Durbrow, 309 Montgomery
Russell Reduction & M Co, California	8	1c	Nov 11, Dec 19, Jan 16	J Morizio, 33 Geary
Sierra Nevada S M Co, Nev	103	25c	Nov 8, Dec 14, Jan 3	E L Parker, 309 Montgomery
Silver Lick Cons M Co, Nevada	3	2c	Nov 22, Jan 3, Jan 25	W Ladd, 531 California
Sultan Eureka M Co, Nev	1	20c	Nov 2, Dec 2, Dec 31	A Halsey, 328 Montgomery
Teresa M Co, Mexico	9	10c	Oct 25, Nov 29, Dec 16	R J Williar, 36½ Market
White Mountains M Co, California	2	1c	Oct 13, Nov 22, Dec 12	S K Nichols, 320 Sansome

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Gould & Curry S M Co, Nevada	Annual	A K Durbrow, 309 Montgomery	Dec 19
Hale & Norcross S M Co, Nevada	Annual	C E Elliott, 309 Montgomery	Dec 6
Mt Diablo M & M Co, Nevada	Annual	R W Heath, 318 Pine	Dec 19
Trinity River Tunnel M Co, California	Special	E L Griffith, 28 California	Dec 15

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE
Bulwer Cons M Co, California	5	L Osborne, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 320 Pine	Sept 19
Cons Cal & Virginia M Co, Nevada	50	A W Hastings, 309 Montgomery	Aug 17
Eureka Con M Co, Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Dec 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 26

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 9.		WEEK ENDING Nov. 16.		WEEK ENDING Nov. 22.		WEEK ENDING Nov. 30.	
Alpha	.20	....	.25	.30	.25	.30	.25	....
Alta	.20	.25	.20	.25	.25	.30	.25	....
Andes	.40	.45	.45	.55	.45	.55	.45	....
Belcher	1.55	.40	1.50	2.25	1.60	2.50	1.60	1.85
Belle Isle	....	....	.05	....	.05	....	....	....
Best & Belcher	1.35	1.60	1.40	1.85	1.45	1.85	1.40	1.60
Bullion	.30	.40	.35	.80	.50	*.85	.60	.90
Bodie Con	....	....	.20	.25	.15	.25	....	....
Bulwer	.20	....	....	....	.20	....	....	....
Commonwealth	....	....	....	....	....	....	....	....
Con. Va. & Cal	2.75	2.90	2.80	3.15	2.55	3.25	2.60	2.90
Challenge	.50	.55	.60	.70	.55	.75	.55	.70
Chollar	.65	.70	1.00	1.20	.75	1.3	.70	.95
Confidence	1.65	1.70	1.60	1.90	1.80	2.00	1.95	2.00
Con. Imperial	....	....	.05	....	....	....	....	....
Caledonia	.20	....	.20	....	.20	.25	....	....
Crown Point	1.05	1.40	1.00	1.35	1.00	1.55	.95	1.10
Crocker	....	....	....	....	....	....	....	....
Del Monte	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.10	....	.10	.20	.15	.26	.10	.25
Grand Prize	....	....	.05	....	....	....	....	....
Gould & Curry	.80	.93	.65	1.10	.85	1.2	.70	.85
Hale & Norcross	1.50	1.40	1.30	1.55	1.45	2.10	1.35	1.70
Julia	.15	....	.10	....	.10	....	....	....
Justice	.10	....	.05	*.30	.20	.30	.25	....
Kentuck	*.15	....	.20	.25	.20	....	.15	....
Lady Wash	....	....	.10	....	.10	....	.10	....
Mono	.25	....	.25	.30	.25	....	.15	....
Mexican	1.20	1.40	1.25	*1.80	1.60	1.90	1.50	1.65
Navajo	....	....	.05	....	....	....	....	....
North Belle Isle	....	....	....	....	.05	....	....	....
Nev. Queen	.05	....	....	....	.15	....	....	....
Occidental	.10	....	.10	.15	.10	.15	.30	.35
Ophir	2.45	2.75	2.60	2.90	2.55	3.20	2.55	2.80
Overman	.30	*.60	.50	.60	.30	.50	.50	.70
Potosi	.85	.95	.93	2.25	1.40	2.45	1.25	2.10
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	....	....
Savage	.60	*1.20	1.15	1.65	1.25	1.80	1.20	1.35
S. B. & M	.25	.30	.25	.50	.30	.50	.25	.30
Sierra Nevada	1.10	1.30	1.05	1.40	1.15	1.60	1.15	1.25
Silver Hill	.10	....	.05	.10	.10	....	.10	....
Scorpion	....	....	....	....	.10	....	....	....
Union Con	1.00	1.10	1.05	1.40	1.15	1.65	1.15	1.25
Utah	.10	.20	.15	....	.10	.20	.10	....
Yellow Jacket	.85	1.10	.80	1.15	.85	1.15	.80	.90

*Assessment added.

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC COAST BORAX COMPANY. San Francisco, Nov 30, 1892. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 24) of One Dollar ($1.00) per share was declared, payable SATURDAY, December 10, 1892, at the office of the company, No. 101 Sansome Street, Room 26. Transfer books will close December 5, 1892, at 3 o'clock, P. M.

ALTON H. CLOUGH, Secretary.

PRODUCTION OF CAUSTIC SODA BY ELECTRICITY.—A process for making caustic soda by electricity has recently been discovered in England. It is stated that caustic soda, chlorine and other chemical products can be produced directly from the brine by this process. The *Northwestern Daily Gazette* of England says that the most careful tests applied up to the present time show an economy of over 50 per cent as compared with present methods. It is described as the simplest of all the known processes of soda-making, the caustic soda being produced direct from the brine in one operation instead of two. At present, carbonate of soda is first produced, and from that the caustic soda is made. The valuable chlorine is also saved and utilized for the production of bleaching powder and other lye products. Eminent chemists and electricians, it is said, have already pronounced the new method a complete success from a chemical point of view, and that there is every prospect of its being worked as a commercial success.

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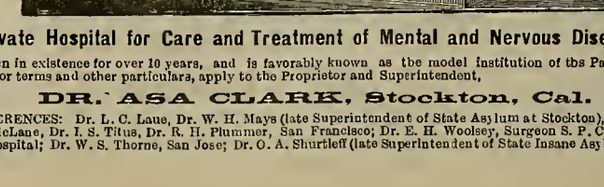

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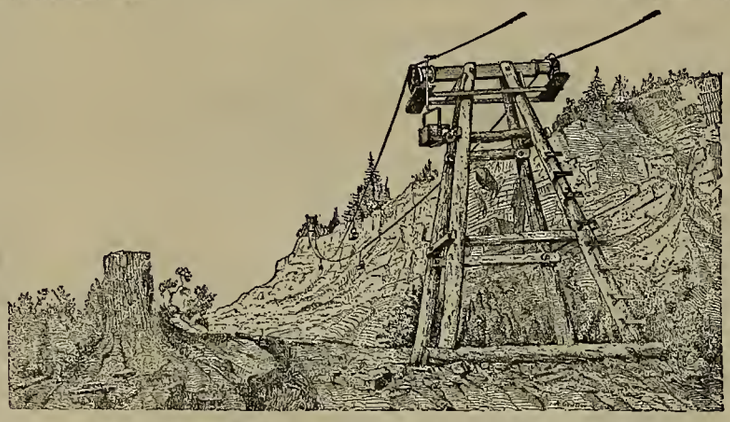

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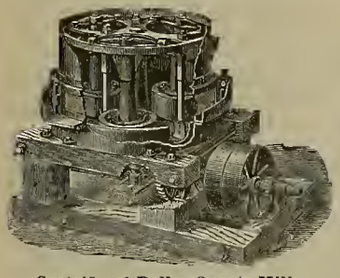

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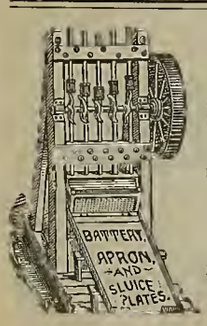

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VOL LXV.—Number 24.
DEWEY PUBLISHING CO.

SAN FRANCISCO, SATURDAY, DECEMBER 10, 1892.

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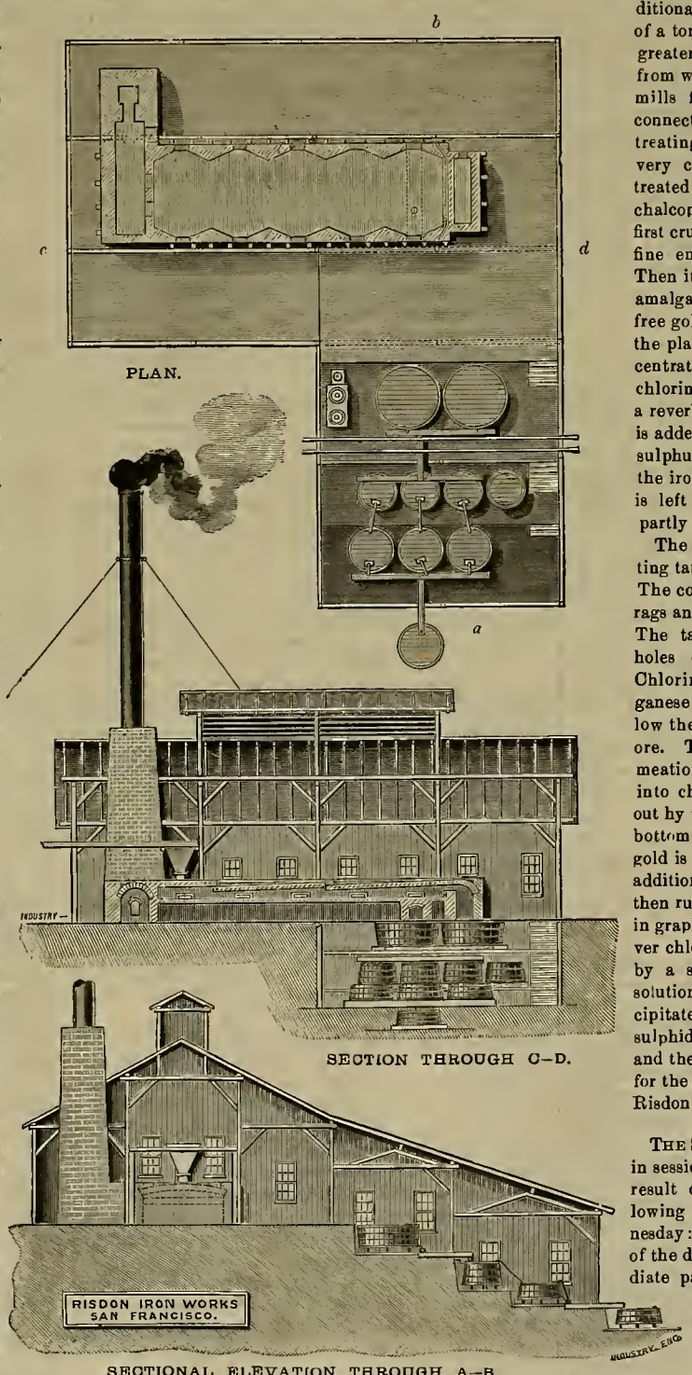
SINGLE COPIES, 10 CENTS.

The State Mining Bureau.

We are informed that the State Board of Examiners, while in session at Sacramento this week, has officially refused to publish the annual report of the State Mineralogist, and referred the whole matter to the legislature. It decided to publish the few pages of introduction to the report written by the State Mineralogist, and also the short report of the Board of Trustees of the State Mining Bureau; but the bulk of the report embracing the work of assistants in the field, and the special papers, is refused publication. This will not be very pleasant news to the Bureau or the miners of the State. What the basis of the refusal to publish may be, we do not know; but it is understood that the report is too extended and covers some ground already gone over. It must be confessed that some of the reports already published would have been improved by more judicious condensation; but if this had been the case in the present instance, the pruning could have been done without summarily throwing out the whole report. The effect of referring the report to the legislature under these circumstances will be to call closer attention to this State institution and the methods under which it is conducted. Its object and purposes will be discussed, as will also the question whether it is accomplishing what it is intended to do. All this should be beneficial to the Bureau in the end, since, if its work is not satisfactory, it should be made so. While the miners of the State may differ on their estimate as to the value of the reports published, and the character of the material in these reports, they will certainly object decidedly to a cessation of the publication. The State Miners' Association, at its recent convention, indorsed "the work and purposes of the State Mining Bureau," and the mining representatives in the legislature will object to seeing the work stopped.

California's Mineral Exhibit.

There is a great demand for apace in the mining building at the World's Fair, and most of the States that have been awarded space are fast completing arrangements for their exhibit. California, however, is one State which is showing a decidedly lagging spirit. Though it was assigned one of the most desirable parts in the Mines and Mining building—in the center main aisle and directly opposite the Mexican display—the California World's Fair Board has not yet accepted this space. Moreover, in a recent letter to the World's Fair management, the secretary of the California association said they were not yet in a position to state whether they desire the space alloted them. There is a reason for this, however, not generally understood. In a recent Supreme Court decision in this State, relative to the utilization of the State appropriation, it was set forth that all the moneys must be spent in the State building. While, therefore, the Commission set aside $15,000 for a California mineral exhibit, they thought it necessary to put it in the State building instead of the Mining building. The Commission, however, this week decided to make the mineral exhibit in the proper building, and arrangements are being made to that end. It is understood that a typical mineral exhibit will be selected from that already in the State Mining Bureau, and such additions will be made as can be collected within the next few months. The Commissioners are anxious to make a good mineral exhibit, and Mr. Robert McMurray, who is one of the board, is doing all he can to accomplish the object. The State Miners' Association will assist, and all that is now needed is the help of the miners themselves. If they will try and hunt up any unique specimens they may have, or anything which would be of interest, and forward them to the Commission in this city, they will be doing a good thing for the mining industry of California.



CHLORINATION MILL FOR WORKING SULPHURETS.

G. A. BUFFINGTON is down from Dunsmuir.

A Chlorination Mill.

The sulphurets or concentrates caught by vanners or concentrators in gold mills have to be subjected to an additional process to recover their values. The value of a ton of these concentrates is usually many times greater than the original value of a ton of the ore from which they have been extracted. Large gold mills frequently have their chlorination mill in connection with the stamp mill, for the purpose of treating the sulphurets. The following description very clearly illustrates this process: The ore treated is quartz, carrying free gold, pyrites, galena, chalcopyrite, arsenopyrite and zinc blende. It is first crushed in rock-breakers, and then stamped fine enough to pass through a 40-mesh screen. Then it passes as a slime over silver-plated copper amalgamating plates to the concentrators. The free gold is saved in the stamp batteries and on the plates; the sulphurets are collected by the concentrators. The latter are dried and then roasted, chlorinated and leached. The roasting is done in a reverberatory furnace. About 1 per cent of salt is added near the close of the operation. All the sulphur, arsenic and antimony are expelled, and the iron and other base metals oxidized. The gold is left in a free metallic state, the silver being partly concentrated into a chloride by the salt.

The roasted ore is then transferred to chlorinating tanks, each holding from two to three tons. The covers are put on, and the joints calked with rags and luted with dough, to make them gas-tight. The tanks have false bottoms, perforated with holes of suitable size and covered with sacking. Chlorine gas, made from salt, black oxide of manganese and sulphuric acid, is then introduced below the false bottom and allowed to permeate the ore. Two or three days are required for their permeation. The gold and silver is thus concentrated into chlorides. The chloride of gold is leached out hy water added at the top, and drawn off at the bottom and run into precipitating tanks. The gold is precipitated in a fine metallic state, by the addition of the sulphate of iron. The water is then run off, the gold collected and dried, melted in graphite crucibles and cast into bars. The silver chloride remaining in the ore is dissolved out by a solution of hyposulphite of calcium. The solution is run into other tanks, and the silver precipitated as a sulphide by adding calcium of polysulphide. The sulphide of silver is dried, roasted and then melted and cast into bars. The designs for the mill shown on this page are those of the Risdon Iron Works of this city.

THE SOUTHWEST SILVER CONVENTION has been in session at El Paso, Texas, duringthe week. The result of its work may he summed up in the following resolution, which was adopted on Wednesday: "We demand of Congress the restoration of the double or bimetallic standard by the immediate passage of a bill for the free and unlimited coinage of silver at a ratio not to exceed sixteen to one of gold, and silver coined to be a full tender for all debts whatsoever." A resolution demanding statehood for Utah, New Mexico and Arizona was enthusiastically adopted. .

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W. B. EWER, CHAS. G YALE, ... EDITORS
ALFRED HOLMAN ..... MANAGER

Our latest forms go to press on Thursday evening.

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San Francisco, December 10, 1892.

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Comment.

We receive many letters from millmen who have been experimenting with the cyanide process, who, while they seem able to dissolve the gold in the ore, are unable to get all out of the solution. This is the general complaint in experimental cyaniding operations. In conversation this week with Mr. E. W. Merrill who has had considerale experience with this process, he said that "the main trouble is that the people who fail in this allow their solution to flow too rapidly through the zinc and do not keep the zinc loose enough; that is, they let it pack. When the zinc is put in they let it go in lumps instead of letting it set as lightly as possible. A further difficulty is experienced through not having a box large enough and not having this box insulated. There are several forms of boxes, but a thoroughly insulated iron box with tar and asphalt is good. At the Mercur mill, Utah, this is used and does the best work. It should be understood that in cyaniding operations the fine ore is going to give the most trouble; that is, where they have to crush the ore very fine. A roasted ore will filter all right, but with finely crushed raw ore there is apt to be trouble. It gives such a slow leaching rate that the amount of time and cyanide consumed is great. If a man would invent a machine which would agitate and filter at the same time, it would be a great advantage, but efforts in this direction have thus far been futile."

The report of the board appointed to select a site for a Pacific coast deep harbor has been filed. It recommends San Pedro as against Santa Monica. The last-named was the choice of the Southern Pacific Railroad, and last year C. P. Huntington wrote a letter to Senator Frye, chairman of the Commerce Committee, favoring Santa Monica. After the Government worked fifteen years or so to make a harbor at San Pedro and finished its breakwater, etc., it would seem the best place to make a really good deep-water harbor. There is a good natural nor'west shelter at San Pedro which answers in summer, but outside the breakwater the place lies open to winter southeasters. There is good room inside the breakwater, but much dredging would have to be done to make it fit for deep-water vessels to enter at all stages of tide. Santa Monica has no natural nor'west shelter for summer, as it is a mere open roadstead, but Point San Pedro gives it partial shelter from southeasters. Still it by no means compares with San Pedro, where so much work has already been done. San Pedro was the principal port in the old hide-droghing days when California belonged to the Mexicans, and a mighty mean place it was then in winter, the vessels having to slip and go to sea as soon as the wind veered south in winter months. Still, it is sheltered from the summer winds. The swell is less there than at Santa Monica, and the engineering difficulties for building an artificial harbor are less. If the selection of the proper localities for the necessary harbor improvements were left to the engineers, without the interference of railroad or real estate corporations, they could get something done worth while; but the trouble is, the Government is too often asked to build up a place for the benefit of individuals or companies, rather than the general public. With a good big single appropriation, such as was—for a wonder—given to Humboldt, for instance, the engineers could do something with San Pedro, which would give Los Angeles a decent port for deep-water ships. As the metropolis of the south coast of California, it should have such a harbor and have it without further delay.

River-bed mining is carried on at many places in this State with considerable success. In most localities it is conducted in the old-fashioned way, and in others newer systems have been applied. The largest operation in the State, in Butte county, where a very long and expensive tunnel was run to carry the whole river, and lay bare some miles of bed, was not successful. An instance of successful operations on a new plan is at Mammoth Bar, south fork of the middle fork of the American river, about ten miles from Auburn. Here Col. W. S. Davis has been using a gravel elevator such as was described in the PRESS two weeks ago, stripping several hundred feet of bedrock at a depth of 60 to 70 feet from the surface. Over 100 men, mostly Chinese, have been employed. These present river-bed mines are but beginning to be worked on a systematic and successful scale. The introduction of the gravel elevator was a vast stride toward overcoming the difficulties and uncertainties attendant upon the old methods of flume, wheel and China pumps. The main drawback to the extensive prosecution of this class of mining at present by this method, and in the section referred to, is the lack of sufficient waterpower. Col. Davis is able to secure but 400 inches, for which he pays 10 cents an inch. Could he secure all he desired, he would have 500 men employed another season. There are many rich bars on this stream waiting to be worked in the same manner, and only wanting water. The McKinstry estate at Butcher Ranch, owning rich seam diggings near the river, from which a $2500-nugget was lately taken, possesses an 11-mile ditch with a present capacity of 100 inches, bringing water from Owl creek. This can be purchased, and probably could be enlarged to carry sufficient water for working some of these river gravel claims.

ON Monday, at the Union Iron Works, steam was raised in the Monterey's boilers, and applied to the hydraulic force by which the gun carriages are operated. The adjustment of the contrivance for taking up the recoil of the big 10 and 12-inch guns, or rather reducing it to a minimum of something like 40 inches, is a nice piece of work, and Lieut. Nicholson, the expert in such matters, is insisting that everything shall be just so before the guns are mounted. The contractors have finished their estimates of the weight that is to be put on board in place of the turret armor, crew, stores, ammunition, etc., and will be ready for the horsepower trial late this month. The vessel is expected to go into commission on January 10th, but much yet remains to be done.

The idea of having a topographical map of California on a larger scale than yet exists is being discussed, but there appears to be quite a difference of opinion with respect to it. The plan proposed is for the U. S. Geological Survey to manage the work and the State pay half the expense. The scale proposed is an inch to the mile and it will cost the State $25,000 a year for eight or ten years. It is only proposed to map the valley and foothill lands, as the gold belt of the Sierra is now being mapped by the Survey. The Academy of Sciences has passed resolutions in favor of the scheme, while the Technical Society of the Pacific Coast—in which there are many engineers—refuses to indorse it. The subject is one of considerable interest and we should be glad to have engineers and map-makers express their views in the columns of the PRESS. Some of the other States have these detailed maps, and we have, in California, arrived at a period when one is desirable here. The main question is, how to get it without too great expense. If it can be shown that the Government and the State can advantageously combine to make the map, there would be no objection. Many believe, however, that it could not be done for the cost stated. Others, again, believe it can. We should like to have some written opinions on the matter from people who have had experience in such things.

Trinity county has taken the necessary steps to form a County Miners' Association, and next Sunday the organization will be perfected. Judge T. E. Jones, Dr. S. L. Blake, P. M. Paulsen, Henry Burns and James W. Bartlett have drawn up the necessary constitution and by-laws which will be adopted on Sunday. All the mining counties in this State should maintain these organizations, which give strength and backing to the State Miners' Association and enable it to accomplish something. There are now between 4000 and 5000 miners in California banded together to aid their industry. It only costs in money a few dollars a year, but with a strong organization they are in a position to have attention paid to their demands. Trinity is mainly a mining county, but until now there have been no attempts at organization among the miners. There are still several counties without miners' associations, but they should all come into line at once.

It may be news to many that the labor employed in the actual production of the precious metals is extremely well paid and very productive—better paid and more productive, in fact, than any of the other industries of the country. There are employed in the gold and silver mines of the United States 57,307 men. The census statistics show that the average earnings of these men was $729 per year, while the average output per man amounted to $1732 a year. In the granite-quarrying industry the average output per person in 1889 was $648 and the average wages per annum $431. In coal-mining west of the Mississippi river, the average value of output per person employed was $675 and average wages earned $474. If miners and laborers underground are classed together, as all classes of labor above ground are, the average wages earned underground would be $3.04 per day, as compared with $2 51 above ground. Taking the whole United States, the average wages paid in precious-metal mining are for surface foremen, $4.04; mechanics, $3.67; laborers, $2.51; below ground, foremen, $4 16; miners, $3.12; laborers, $2.46. The averages are brought down by low prices paid in Southern States. The highest wages are paid in Alaska, Idaho and Nevada.

Foundry Notes.

THE Fulton Iron Works are preparing their new site on the waterfront at Harbor View, and will soon commence operations out there. Ever since the fire, the proprietors have been anxious to get suitable shops. The new company will engage extensively in ship-building, and will have ample facilities for this class of work. It has already established a good reputation for marine work, but with wharves, ways and docks will have exceptional facilities. It will not be very long before the new plant will be in operation, and many things are being moved this week.

An opinion, dated December 5th instant, has been handed down by the Hon. Joseph McKenna, Judge of the Circuit Court of the United States in and for the northern district of California *in re* S. R. Smith *et als*, patentees of the "Climax" bandsaw mill, *vs.* the Vulcan Iron Works of this city, which briefly stated, orally, by the court, is as follows, viz.:

"This is an action for the infringement of a patent for a bandsaw mill. The defense is want of invention and of novelty, and that respondent has not infringed." A great deal of testimony was taken and the case ably and elaborately argued; and, after quoting the statements of the counsel of the complainant, and as well that of the counsel for the respondent, in which arguments were submitted as to the main points involved in the claims of the two patentees, and resting principally upon the fact of the casting of one machine in one piece and the other in two pieces. The court determines in the following language: "Manifestly, if casting in one piece is the best, its advantages are secured by casting in two pieces and bolting them together, as in the machine of the respondent. It is certainly an equivalent, and could not be excluded except by express words of the patentee, confining his invention to the other form. The view is clearer as to the straining devices. There are undoubtedly invention and novelty in them, and those used by the respondent are substantially similar. It imitated as closely as it dared and not make exact resemblance. A decree will be entered for the complainant."

The foregoing epitome of the decision of the Hon. Judge of the U. S. Circuit Court in and for this district we believe will be of interest to all who are or intend to become interested in the lumber industry of our Pacific States, for it declares that the bandsaw mills built by the Vulcan Iron Works, of this city, are infringements upon the principles involved in the construction of the "Climax" bandsaw mills built by Messrs. Smith, Meyers & Schiner of Cincinnati, Ohio, for the sale of which the Joshua Hendy Machine Works of No. 51 Fremont street, this city, are the agents.

DURING the month of November, local corporations paid a total of $367,175 in dividends, against $379,325 for the same month in 1891. The insurance companies paid $5875, gas companies $86,000, water companies $70,000, powder companies $19,500, street railroad companies $18,000, mining companies $157,300 and miscellaneous companies $11,000.

Coast Industrial Notes.

THE Bodie *Miner* says it is rumored, and the report seems to be given credence, that by the 1st of January the number of men employed in the mines there will not be more than one-half of those at work now. The outlook for the immediate future is not very encouraging.

A LARGE water-storage project is that on the Arizona canal, nine miles from Phœnix. Work will begin at once to put an embankment on the west side of the canal at the distance of three miles, which will form a lake of that length and 20 feet deep. Water will be let in from the Arizona canal during the rainy season.

AT the meeting of the Alameda Board of Supervisors this week, the petition of the Oakland, Alameda and Piedmont Railway Company for permission to change its system to Alameda from a streetcar line into an electric road was granted. The work of making the change has been commenced. Senator Eli Denison and Colonel F. H. Meyers are the principal backers of the road.

THE Bitumen Consolidated Mining Company has sued the San Francisco Paving Company to recover $12,000 damages for the breach of a contract by the defendant not to purchase any bituminous rock, except from the plaintiff, for two years from January 1, 1892. The rock was to be paid for at the rate of $7 a ton, delivered at the wharf in San Francisco from San Luis Obispo, and $6 a ton from Santa Cruz.

WHITE HILLS, Arizona, from present indications, will soon be the most thriving and prosperous mining camp on the Pacific coast. There is no rush or stampede to the new mines, but a steady influx of intelligent miners who have come to stay, and know a good thing when they find it, and one and all declare that White Hills is far ahead of anything they have run across since the palmy days of '49.—Mohave Miner.

THE Palace Grande Coal and Transportation Company has struck a vein of brown coal in its new tunnel on Mark West creek, five miles northeast of Santa Rosa. The company, including several citizens of Santa Rosa and vicinity, with several well-known mining men of San Francisco, has secured about 2000 acres of the coal land, including Dr. F. Wrightson's ranch, for which they paid $10,000, and intend pushing developments.

THE Must-Condensing Company of Geyserville is anxious to remove its plant to Healdsburg, providing the citizens of that place will give it some inducement in the way of a bonus. Baron Schilling, one of the biggest stockholders of the Must-Condensing Company, was in Healdsburg last week, and all the citizens he had spoken to in regard to the scheme gave him much encouragement. Healdsburg needs a few more manufactories.

J. F. BERGIN, president of the San Francisco and North Pacific Railroad. F. S. Chadbourne, W. D. Sanborn, Al Wieland, Fred Yungling, H. N. Gray and General McMutrie, and other San Franciscans, have been at Ukiah, Mendocino county, looking up the prospects for building a railroad from Ukiah to Round valley, 60 miles distant, where a large body of coal is said to lie undeveloped. The storm interfered with the trip.

THE Electric Light Company has commenced to carry out the order of the Board of Supervisors, passed a fortnight ago, to replace the large 160-foot masts in the district bounded by Castro, Folsom, Twenty-first and Twenty-ninth streets, with 40-foot masts. Poles are being placed on Church, Guerrero, Dolores and many of the streets, preparatory to the change. It is the intention to erect 65 of the smaller masts of 2000 candlepower in place of the larger 16,000-candlepower lights. The change is very distasteful to Mission residents.

THE Pine Ridge flume has been completed sufficiently to turn the water into Dry creek from Stephenson creek, 12 miles beyond. Water is brought in sufficient quantity to irrigate 50,000 acres of land in Fresno county, which have never yet been under a canal. This flume is the largest in California, and the first 12 miles were completed last summer. It will be extended to Fresno next year for the purpose of floating lumber in addition to its irrigation facilities. Additional arrangements are being made to build the flume still farther into the mountains to tap the upper tributary of the San Joaquin river.

THE *Enterprise* says the unfavorable outlook for Virginia at present is engaging public attention. The low prices governing mining stocks, the number of men out of employment, the financial condition of Con. Virginia, and the barren appearance of the mines in general, is affording food for serious meditation, which has, to say the least, a depressing effect. The heavy drafts of men in the Gold Hill mines would in themselves be a serious weight upon the temporary prosperity of the lode, without the addition of unfavorable conditions in Con. Virginia affairs. The mine is not self-supporting and an assessment is staring the stockholders in the face.

STEWART MENZIES, Oliver Eldridge and Charles Nelson, the committee appointed by the Chamber of Commerce to draft a bill in favor of a training-ship for the coming meeting of the legislature at Sacramento, have in hand a report on the schoolship St. Mary's, prepared by the Chamber of Commerce of New York. It appears from this report that the boys who have spent two years on board the St. Mary's are good ordinary seaman, and most of them fairly good navigators. The committee named above have fully considered both the St. Mary's or American plan and the Conway or English plan. The ship to be used, if the legislature takes action, will be a school in the strict sense of the term and not a reformatory. The idea is to make good American seamen.

A NEW irrigation canal is being surveyed from Lake Tulare northward to the San Joaquin river, near Mendota. A corps of engineers are at work and have the preliminary survey about done. It is not understood what company is at the head of the enterprise further than that the Sunset Irrigation Co. has nothing to do with it. The canal will be about 80 miles long. It will follow northward along the center of the valley. Water will probably be stored in Lake Tulare in the winter and used in the dry season. It is also said that waste water from another canal will be led to this canal and used for irrigation the second time. The eastern side of the valley slopes gradually toward this new canal, and in many places there are streams of considerable size flowing from old canals as waste and superfluous water.

IN the Senate, Wednesday, after the presentation of the treasury report and the President's message in regard to a naval establishment on the great lakes, Hill introduced a bill to repeal the Act of July, 1890, directing the purchase of silver bullion. It was referred to the committee on finance.

MILLER & LUX, says the San Benito *Advance*, have at this time on their great ranch in Kern county, 28,000 sheep, 35,000 cattle, 6000 hogs, 12,000 tons of alfalfa-hay, 28,000 sacks of barley, 12,000 sacks of wheat, 5000 sacks of oats. Also 3000 acres of Egyptian corn, which will produce yearly 6000 tons of cereal food.

A NUMBER of important changes are being considered by the directors of the Oakland and Berkeley electric railroad. One of the propositions is to run the cars only as far as Seventh and Franklin streets, and put a single car on Franklin street from that point to First street. Then the cars of the Sixteenth-street branch will run down to Seventh street, as will also the cars of the cemetery line. This change would give Franklin and Grove streets a two-minute service. To Fortieth street the cars would run every four minutes, and Berkeley would have a six-minute service. The Telegraph-avenue electric road is now about completed, and it is expected that trial trips will be made within two weeks, and regular service commenced by the first of January.

AN important enterprise of a mammoth electric-light and power plant in the Santa Ana canyon, about nine miles from San Bernardino, has been under consideration for several months past. Its proposed scope is to furnish electricity to San Bernardino, Riverside, Redlands, Colton and other neighboring places. W. H. Goucher has been in charge of the preliminary work of making surveys and formulating plans for the great work on behalf of a number of Eastern capitalists. The plans, together with all obtainable data as to the possibilities of the scheme, were recently sent East to the Westinghouse Company for expert examination and approval. It is estimated that the entire plant will cost $500,000, and a large item of the cost will be the piping of the water under pressure to be used in operating the works. This will require about seven miles of heavy piping, but will give a pressure at the point of application that will furnish a maximum of 8000 horsepower. The machinery necessary for the plant will cost about $250,000.

A DISPATCH from San Diego says: J. L. Clark to-day completed the sale of the great onyx quarries at Los Tules, Lower California, owned by the widow of the late Cassimiro Murillo. The money was paid over by the consolidated National Bank, which held the purchase papers in escrow. The price paid was $100,000, half cash and the balance in stock of the company which has been formed to work the deposits. The purchasers are: Ex-Governor Eli H. Murray and George Foster, of this city, partners of Murillo, J. P. Alexander of Louisiana, Professor George S. Fellows of Washington and capitalists whom Fellows represents. The quarries are to be worked on a large scale, the rock being shipped in the rough to San Diego, where it will be blocked and forwarded to an Eastern factory for polishing and cutting. As business progresses, it is intended to establish a factory at San Diego. The quarries are about 200 miles south of San Diego, 20 from the gulf and 50 from the Pacific.

THE other day Judge Morrow of the U. S. District Court decided the case of Charles R. Allen vs. the United States. Allen is the owner of a steam vessel, and used imported coal, upon which there is a duty of 75 cents per ton. Under the tariff law previous to October 1, 1890, the duty on imported coal used on steam vessels owned in the United States was subject to a rebate, but after the passage of the McKinley bill the customs officers refused to pay the rebates, on the ground that the new law repealed all tariff laws previously in existence, and did not specifically provide for this rebate. Allen brought suit to recover rebate on something over 190 tons of imported coal. The case was tried before Judge Ross in September, and a decision rendered in favor of plaintiff. A demurrer was entered and argued before Judge Morrow. The case was submitted for consideration and decision of questions of law, and his Honor sustained the decision of Judge Ross. The McKinley bill provides that on all articles imported into the United States on which duty is paid and used in manufactures which are again exported, the duty paid may be rebated to the importer. On this provision the decion is based. The case will settle a question of considerable importance to owners of steam vessels in the United States, as they will be able to get coal practically duty free.

THERE is a proposition to utilize the street-sweepings of this city to fertilize the soil in Golden Gate Park. The material will all be carried out at night and the transportation is to be done by the new electric-car line. Mr. Esston, president of the new line, says: "Any of the motors we have now can haul the cars out at a moderate speed, and as we intend to run a branch right down to the park we can dump the fertilizer just where the commissioners want it. The work will all be done at night, and that will warrant us in giving our patrons an all-night car. None of the cable roads have been able to do this, because the expense would be too great. But an electric line can and will. We may run half-hour trains from midnight until 5 o'clock in the morning, but if the travel warrants it we will make the trips more frequent. You can state it as a positive fact that our road will give the first nightcar, and that in a very short time. We intend to double our equipment inside the next sixty days to meet the increased travel. It will cost just $200,000. The cars we are running now on the main line will be put on the branch to the Olympic Club grounds. The new cars for which we have called for bids will be double-enders, setting closer to the ground than the one now in use. Then there will be several large open cars. They are in great demand, and we find it absolutely necessary to have them.

AT the last meeting of the State Board of Prison Directors, an order was made looking to the establishment of a cordage factory at Folsom prison. The warden was directed to get estimates of the cost of machinery for the manufacture of cordage, to the end that the directors might make a recommendation upon the subject to the Governor and the legislature. The State has just constructed at Folsom, at a cost of more than $100,000, a powerhouse to utilize the water of the American river. This building contains seven Leffell wheels, capable of producing 700-horse power. The water will be turned on at these works some time next month, and the directors of the prison are casting about to utilize the power. Mr. Sontag is decidedly in favor of establishing a cordage factory, and a bill will be introduced in the legislature to that end. It is probable, however, that there will be opposition to the plan, as many people dislike to see convict labor come into opposition with free labor. In the matter of jute bags, the needed amount cannot be supplied by factories in this State, but in the matter of rope it is different. The cordage factories now running here can supply all the demand.

Ada counnty, Idaho, is having a diamond excitement. On the south bank of the Snake river, near Walters Ferry, a diamond field is announced as discovered and said to be of the same nature as that of the Kimberly fields, South Africa. The discovery, which has created such a furor, was made about a week ago by a party of surveyors who were at work on the site of a proposed dam, near the mouth of the Bruneau river, in Owyhee county. Suspecting that the peculiar stones which they had unearthed were either opals or gems of even greater value, the engineers communicated with friends in Portland, Oregon, to whom they forwarded half a dozen specimens. The Portland people were assured by two reliable jewelers that the stones were diamonds. Upon the next Eastbound train nine excited men left Portland for Nampa, Idaho, arriving at that town and proceeding immediately to the scene of the discovery. Their evident haste and their manifest efforts to maintain strict secrecy as to their movements awakened the curiosity of Assessor Russ Walter of Ada county and he followed the party. It did not take him long to discover the object of the headlong race of the men from Oregon, and as quickly as he could do so he repaired to Walters' Ferry, and by telephone ordered Attorney C. C. Stevens of Boise city to prepare necessary papers for the location of three 20-acre diamond claims. He also wired Charles Van Dorn and James Lawrence to hold themselves in readiness to accompany him to the scene of the reputed bonanza where he would put them upon rich claims. This will not create much interest in California for we had a "diamond excitement" here some years ago which turned out disastrously to all except those on the inside. Montana had some diamond fields also, but no one has become rich out of them. The Idaho fields may be of value, but we should want the testimony of other than a few excited prospectors before investing in any claims.

Personal.

C. C. WALLACE is down here from Eureka, Nev.

C. L. CLARK, a mining-man from Helena, Mont., is at the Russ House.

E. W. BURK, interested in mines at Helena, Mont., is visiting San Francisco.

MR. A. B. PAUL of Middle Creek, Shasta county, is in the city for a few days.

ALF. TREGIDGO, Pres. of the Nevada County Miners' Association, has been in the city this week.

MR. HOFFMAN, superintendent of the Red Point mine, Forest Hill divide, Placer county, is in the city for a few days.

MR. J. H. NEFF, President of the State Miners' Association, was seriously hurt this week, and is confined to his home at Colfax.

J. E. DOOLITTLE, the well-known mining man of Dutch Flat, who, by the way, does not like the Caminetti bill a little bit, is in the city.

MESSRS. ANDREW, BEVERIDGE AND ROCHFORD, mining men of Salt Lake City, are in Winnemucca, Nev., for the purpose of inspecting several mining properties.

DR. E D. PETERS, JR., of Boston, the well-known copper expert and author of "Modern Copper Smelting," arrived in the city this week on his way to Australia, where he will remain six or eight months. He goes to make an investigation into some extensive copper properties, and prepare plans for suitable reduction works.

MR. C. W. MERRILL, who has been at Bullychoop, Trinity county, for some time past, has returned to the city, the mine having closed for the winter. Mr. R. G. Hart, the owner of the property, did not get the tramway completed in time, so he will not be able to work during the winter. Mr. Merrill has been experimenting with the cyanide process for Mr. Hart.

JOHN B. HOBSON, formerly of Iowa Hill, Placer county, and one of the delegates sent to Washington on behalf of the State Miners' Association, has returned to this city from British Columbia, where he has been during the summer. Mr. Hobson has the reputation of being one of the best hydraulic miners in California, and was sent for to take charge of a hydraulic mine in British Columbia. He will remain in this State for a month or two and then go north again to resume his duties.

THE new State Anti-Debris Association has employed Robert T. Devlin as its attorney. Mr. Devlin has for some time been employed as special counsel for Sacramento county in debris legislation.

Sterling Silver.

All silver coin issued at the British mints, and also all silver goods stamped at the British assay offices, says *Iron*, consist of an alloy, 1000 parts of which contain 925 parts by weight of silver with 75 parts hy weight of copper. Silver of this composition is what is known as standard or sterling silver. With regard to the derivation of the term sterling, Johnson states that the most probable is that proposed by Camden, who wrote: "They are much mistaken who think that our good and lawful money of England, commonly called sterling money takes its name from hence (*i. e.*, Stirling Borough and Castle), for that came from the Germans, who were termed Easterlings by the English from their living eastward, and who were first called in by King John to reduce the silver to its due fineness, and such money in ancient writings is always called 'Easterlings.'" The fioeness of sterling silver is frequently expressed by saying that it is of a standard of 11 oz. 2 dwt., which is intended to indicate that each troy pound of the alloy contains this weight of silver, the remaining weight of 18 dwt. being made up of some other metal. The other metal employed is, as a matter of fact, invariably copper, but it is not necessary that it should be so; the law only requires that standard silver shall contain 11 oz. 2 dwt. of silver per Troy pound, and does not concern itself with the alloying material. In this connection, it may be added that the word alloy, when used in connection with silver, is technically understood to apply only to that part of the mixture which is not silver; thus, in standard silver, the alloy is technically understood to be that 18 dwt. of copper with which the silver is diluted, and does not apply, as in ordinary usage, to any intimate mixture of metals which have been melted together. The word alloy, however, seems to have been first applied exclusively to mixtures of the precious metals, gold and silver, with some other baser metal. Johnson states the word alloy is derived from "*a la loi*," indicating that the standard of the gold or silver was that appointed by law. It seems, however, more prohable that the true derivation is from the French *allier*, to uoite.

The standard of silver now in use appears to have been employed from the Conquest until the present, with the exception of a short period of ten years during the reigns of Henry VIII and Edward VI, from 1542 to 1552. During that period the standard underwent most extraordinary variations, no less than eight separate acts of Parliament being considered necessary to regulate it, mostly to reduce it, and in 1551, during the reign of good King Edward, it was reduced to as low as 3 oz. of silver to the pound, presumably to the advantage of the Royal Exchequer. Once again, in the reign William III, in 1696, the standard was altered, being this time raised from 11 oz. 2 dwt. to 11 oz. 10 dwt. of silver per troy pound. This alteration was intended to prevent the melting down of silver coin into plate, a process which would be somewhat unprofitable nowadays, and which points back to a period which the unfortunate recipients of salaries paid in rupees must think of with regret, when silver coins were not yet merely currency tokens, but actually had the value in metal corresponding with the value stamped on their faces. It appears, however, that the danger of the large withdrawals of silver currency which this Act was intended to prevent must have quickly disappeared again, for in the reign of George I the old standard of 11 oz. 2 dwt. to the pound was again revived, and has continued in force to the present date concurrently with the standard of 11 oz. 10 dwt., which latter is, however, practically never used. Ooe of the chief reasons for once more returning to the lower standard was said to have heen that the articles made of the richer standard did not wear so well as those made with less silver. Indeed, one of the great advantages obtaioed by alloying silver with copper is the great increase in hardness and resistance to wear thus obtained, for pure silver, presenting a somewhat small resistance to abrasion, wears away too quickly.

Attempts have been made from time to time to employ some other metal than copper as an alloy with sllver, but hitherto no very successful results appear to have been obtained. It would seem that copper still holds the first position as yielding an alloy which, while harder and wearing better than pure silver, does not alter its color when present in reasonably small amounts, and does not deteriorate the working properties of the metal for manufacturing processes requiring stamping, rolling, casting or engraving. Recently, however, an interesting application of an alloy of silver, zinc and cadium has been introduced for silver-plating by the London Metallurgical Company, of Turnmill street, London. The alloy is deposited electrically upon the article which is to be coated with the precious metal. An alloy of cadmium and silver is said to work well, and to show greater resistance to abrasion. It is, moreover, not nearly so readily tarnished and blackeoed by the traces of sulphuretted hydrogen always present in the air, as is standard silver. As it is considerably cheaper than pure silver, which has hitherto alone been employed for electroplating purposes, its superior resistance to wearing and tarnishiog actions apparently gives it a great advantage over the ordinary silver-plating, and as its color is equal to that of silver, it should have a good future before it. It appears somewhat extraordinary that, in spite of the enormous advances which have been made in chemical and metallurgical knowledge, no other more satisfactory silver alloy has yet been discovered for coining and other purposes than the alloy used 800 years ago. It is true that alloys of silver and nickel and copper have been manufactured, and, indeed, coins cootaining these metals with small amounts of silver are actually in current use in Switzerland and elsewhere, but no alloy of this character seems to have come into general use in place of standard silver.

It is required by law that, with some few exceptions, the quality of all standard silver articles shall be determined by assay at any certain offices authorized for that purpose, and that, if found equal to standard, it shall be stamped with what is generally known as the hall-mark. It is a popular error to imagine that this hall-mark upon all standard silver articles made in Great Britain is always a lion, or, more correctly, a lion passant. The fact, however, is that in Dublin the hall-mark of the Goldsmiths' Company is a harp crowned, and the nnly silver stamped is that of the 11 oz. 2 dwt. standard. The Edinburgh hall-mark consists of a thistle for the 11 oz. 2 dwt. standard, and a figure of Britannia is added to this to indicate the 11 oz. 10 dwt. standard. At Glasgow, a lion rampant is employed to indicate the 11 oz. 2 dwt. standard, and as at Edinburgh, a figure of Britannia is added to indicate the 11 oz. 10 dwt. standard.

In England, at the assay offices in London, Chester, Exeter, Newcastle-on-Tyne, and York, the hall-mark for silver of the 11 oz. 2 dwt. standard is the well-known lion passant, and to iodicate the richer standard of 11 oz. 10 dwt. a lion's head erased (*i. e*, without the body) is employed. Finally, at Birmingham and Sheffield, the 11 oz. 2 dwt. standard is indicated by the lion passant alone, and the 11 oz. 10 dwt. standard by the figure of Britannia alone. The other marks on silver besides the hall-marks are the letters which indicate the year of assay, and the sovereign's head indicating the payment of duty. At the Dublin office, the figure of Britannia is added for the same purpose, heraldic arms showing the place of assay, the initials of the maker usually being added.

Machine Mining.

Ten years ago machine mining was looked upon almost entirely as an experiment in which few had any faith, or were willing to hazard capital in. To-day the experiment has become an assured success, and machine mining is fast becoming the rule and not the exception. It has been estimated that for the year 1890, out of a total of 12,638,364 tons mined by all methods, 2,881,983 tons were mined hy machinery, being 23 per cent of the total. In one particular district for the same period, of a total of 3,716,464 tons mined, 1,615,453 tons, or 43 5 per cent of the total, were mined by machinery; and in yet another district, covering the same period, of a total of 3,240,204 tones mined, 1,101,262 tons, or 34 per cent of the total, were mined by machinery; and succeeding reports will show increased percentages. In other quarters there will show percentages that, compared with previous years, will prove that machine mining is steadily increasing, and there are scarcely any of the coal-producing districts where machines are not being or have been used with more more or less degree of success, in other respects as well as financially, when under proper conditions, and earnest effort has been made to make them succeed. Ten years ago the miner who worked with or after machines was a "blackleg" to be shuoned by his fellow-workmen, and often followed his occupation at the risk of the "boycott," personal injury, and even loss of life from those opposed to the innovation. This has all changed, and to-day the machine miner and laborer form a large portion of the mining class, and are often the commanding influence. Where machine mioing has been successfully organized and carried out, the result has been greater regularity of work and better wages for employes. So far, machinery for mining is confined to machioes for "undercutting," "shearing," and "drilling," and which, hy cutting the vein horizontally or vertically, and drilling holes for blasting, prepare it for the work of the miner in charging, blasting, assorting, loading, and timhering. Machinery for these latter purposes has not been introduced, though experiments are continually heing made with machines for loading, aod the writer has seen two patterns that in a large vein with good roof would do the work very well; it is to be hoped that a successful machine will finally be devised to relieve this, the most laborious portion of securing coal. The cleaning of coal from its impurities, where the same exist, and throwing them back ioto the goh is a task that can hardly be accomplished by machinery, which can only be expected to lift the mass from the floor and deposit it in the cars. Where these impurities do not exist in too great an amouot, the cleaning can be done more thoroughly and economically by proper coal-cleaning machinery placed in the tipple outside. Electric batteries for firing blasts after the charges are tamped, and the use of lime cartridges and powder wedges for breaking down the coal may be mentioned as attempts to do the breaking down by machinery, but have not come into general use. For timbering, machinery has nothing to offer, and it is only indirectly that a saving can be effected in this departmeot of the work; by deep undercuttings, the roof if tender is shattered less by the blasts; and as machine mining gets over the ground much quicker than the older method, rooms are drlven their length and finished before timbers need replacing. To offset this, places for machinery are generally driven as wide as possible, in order to give the machine the advantage of working steadily aod preventing the loss of time in moving frequently from one face to another; this will take more timber, and it becomes a nice point to determine on the score of economy just where to draw the lioe between the two. The power used to operate mining machinery has been almost entirely compressed air. Of late, electricity has become a recognized factor as such, and there is no doubt but that in time, with improvements in application, it will become more and more so. At present the most successful machinery beiog driven by compressed air necessitates its use, and for this reason is preferred by many engineers.—Machinery.

TIN IN BURMAH.—The tin-bearing deposits in Burmah are, according to Mr. H. Warth, of the Government Central Museum, Madras, of two kinds. First, there is the tin gravel which is found in all or most of the valleys, a mixture of rough, white-quartz pebbles with sand, garnet, black tourmaline and gray cassiterite. The thickness of the gravel varies from one foot to six feet, and the yield of cassiterite may be put down as at least one-fourth per cent or one pound of cassiterite—tin dioxide—in 400 pounds of gravel. There are washings going on at many places, but some valleys have been more or less exhausted. The work suffers also under the disadvantages that the greater part of the country is quite uninhabited, that food has to he brought from a distance, and that there is always danger of sickness. Chinamen are the chief workers. The second kind of tin-bearing deposit is the original eruptive rock, which is weathered so that it is possible to wash out the grains of whitish cassiterite which it contains. Mr. Warth visited the principal deposits of this kind near Malewun in July, 1891. The yield is only 0.04 per cent of impure wash tin.

Pyrites Mining in America.

The pyrites industry in the United States is rapidly becoming a source of increased interest and enterprise. In the matter of supply and economic possibilities, there is, says the *Age of Steel*, ample ground for generous operations and equally redundant returns. The principal sources of the world's supply have been largely confined to the mines of Spain and Portugal, the most important of which have been worked for centuries, the Celt, the Phœoician and the Roman being historic successions in exhuming the European pyrite. The Castilian operations have been more or less desultory political troubles, and the aggressive and pestilent Moor interfering with the steady development of the industry. The enterprise, however, of later years has been less intermittent, and its dividends of a gilt-edged and encouraging character. The distribution of this mineral in the United States, where native enterprise has more or less utilized a long-neglected source of wealth, includes the States of New Hampshire, Vermont, Massachusetts, New York, North Carolina, Tennessee, Georgia and Virginia. It is estimated that the mining of iron pyrites at its present output in the United States is a saving of $1,000,000 in the otherwise necessary importations. The present production compared with the demand is barely ten per cent.

The products of pyrite are its real commercial value. Of these the most direct and important result is sulphuric acid. This acid is multifarious in its applications, and its service in the chemistry of important products is of premier importance. In the manufacture of artificial fertilizers it is practically indispensable. These are in increasing demand in exhausted soils, and in large areas of land where normal conditions are unfavorable to fertility. For this latent deficiency the phosphate-rock industry is simply a response. This phosphate is decomposed largely by sulphuric acid, and to such an extent that the amount of acid demanded by this industry approximates one-half of the total production of the country.

In the refioement of crude petroleum this chemical deduction from the iron pyrite is equally available, and when one cnnsiders the enormous output of the petroleum industry, amounting at present date to an annual tally of not less than $50,000,000 barrels, the importaoce of the pyrite can be readily perceived.

In the manufacture of paper, explosives, alkalies and other articles of every-day use, sulphuric acid is of general and indispensable service. As indicating its utility in commercial and industrial uses, consumption has increased from ahout 40,000 tons in 1865 to an estimated amount of 1,000,000 tons in 1891. The more general use of American pyrites in this manufacture has been postponed for various reasons. The domestic source of supply has heen uncertain, while the necessary and expensive change in plants has been an economic hindrance. Supply, however, is no longer a question of suspense, while the inducements to manufacture are nullifying the objections to the added cost of improved plants. As demand increases and available resources of material are secured, the iostallation of the iron pyrite as a commercial factor in American industry will be of constructive and increasing importance. It is not likely, hut in fact is impossible, that so valuable an auxiliary to natlonal wealth will permanently suffer from neglect or obscurity.

The Geographical Society of California.

Our predictions with regard to the progress of this enterprising Society have been verified. Its membership has now reached 400, with the prospect of a considerable number of accessions by the close of the year. The directors seem to have been indefatigable, and at the same time fortunate, in securing good lecturers, whose addresses have been above the average, such as have succeeded those previously announced by us being: "A Neglected Naturalist, Constantine S. Rafinesque," by the Society's president, Prof. David Starr Jordan; "An Hour or So in Mexico," by E. McD. Johnstone; "Our Navy and Coast Defenses," by Capt. W. E. W. Campbell; "The Sunrise Century" (the geography of the future), by the Rev. Horace M. Du Bose, D. D.; "The Malay Archipelago," by Capt. Henry C. Everill; and "Among the Samoans," by Thos. Crawford Johnston.

These, with that of December 5th by Dr. Fred W. D'Evelyn—subject, "Terra Natalis"—make 14 lectures this year. The special bulletin we referred to in a previous article, containing a remarkable paper by Thos. Crawford Johnston entitled "Did the Phœnicians Discover America?" has been published and has created considerable sensation, owing to the novelty of the theory and the great amount of painstaking, research and perseverance displayed by the author. We understaod that it is the intention of the society that this bulletin shall be followed oo the 1st of January by its first ordinary one, which will contain a selection from the lectures given under its auspices up to the present time.

The Board of Directors has been reinforced by an Honorary Council composed of Col. Chas. F. Crocker, Stephen T. Gage, H. E. Huntington, Prof. Martin Kellogg, Col. Geo. H. Morrison, G. Howard Thompson, Edwin Fretwell, A. S. Hallidie, Col. J. P. Jackson, Hon. E. McKiostry, John Rosenfeld and John J. Valentine.

To Determine What Is Mineral Land.

The Condition of Affairs in Northern California

SHASTA, Shasta Co., Cal., Nov. 28, 1892.

TO THE EDITOR:—The late Miners' Convention in San Francisco suggested that Congress might take the necessary steps to determine definitely what is mineral land and what is agricultural. I wish to show the necessity of such a movement being made as soon as possible. The mountainous portions of Shasta, Siskiyou and Trinity counties have about all been returned as agricultural land in the railroad grant. Hundreds of miners are at work extracting gold, silver, copper and lead from these mountain lands. There has not been mineral land enough returned as such to furnish each quartzminer now at work with one-half the land in a quartz-mine location.

This estimate is taken from the field notes and maps on file in the United States Land Office in Redding. This, then, is what land is open for the miner to explore and locate under the United States Land Law.

When a prospect is found on an odd section, it must be purchased from the railroad company, as no miner should develop a prospect without some surety of title. While the miner is working the property any person can purchase the railroad quitclaim deed to the same. This deed conveys no title, but does convey the money to the railroad company, and just enough law to dispossess the miner and that law was obtained by fraud.

The general reputation of the Southern Pacific Railroad Co. is, that it looks carefully after its own interests without regard to the rights of others. Their grant did not give them mineral lands. Pursuant of their interests, almost no land was returned as mineral within the limits of said grant. A well planned scheme! An examination of the maps on file in the Land Office will show how well it was carried out.

The writer has knowledge of sections of land north of Redding sold hy the railroad company as agricultural, on which there is not an acre that can be cultivated or produce farm products.

The railroad company obtained possession of this land north of Redding by what is known as the Railroad Forfeiture hill, passed by Congress.

This bill, however, did not forfeit, but restored to the company 60 miles wide of land to which they were not entitled, because of failure to build the road within the time stated in the grant, and for the further reason that it is mineral land, not one acre in 500 being fit for cultivation.

On the land restored to them no taxes are paid, but individuals purchasing land from the railroad company must pay taxes on the same.

If this is law it certainly does not belong to a republican form of government. Land under like conditions is taxed to the individual and not to the corporation.

Many miners have filed mineral affidavits on these odd sections, intending to contest before the United States Land Office when the railroad company makes application for patent, expecting to prove that the land is more valuable for mineral than agricultural purposes.

If that was all that was required it could be done, but it is not. The miner must prove he is familiar with each and every one of the smallest legal subdivisions of the section, and that there is a paying mine on each—this is impossible. He might save some of the subdivisions, hut it is doubtful.

The miner must have money to carry on this contest. The very singular laws and rulings under which a contest is carried on make it more necessary for the miner to have money than right and justice. The railroad company sells this land either for cash or on the installment plan, one-fourth cash and one year's interest in advance; then sends a contract for the miner to sign. And what a contract! The instrument appears to have been copied from the peon contract in force in New Mexico about the year 1860, with all the arts, devices and dodges learned from that day to this. In the peon contract a man was allowed his immortal soul after it left the body, hut in the railroad contract there is no limit to the claiming of rights. The trouble lies in the wrong and fraudulent classification of land, which was not made under the law but by trickery.

The quartzminer does not want one acre of land that a farmer can use for farming purposes, hut he does want what is mineral in kind and character and unfit for agriculture. There is classified swamp land, timber land, farming land, school land, hut little or almost no mineral land in the north end of this State.

The remedy is for the legislature of this State to call the attention of Congress to this wrong and have the land reclassified. Miners in each county should see how their land is returned; if mineral in character, that it is so classified, else mining cannot he successfully carried on in the face of so many difficulties. The laws and rulings are not in his favor, and to establish his claim on other than mineral land is almost impossible.

The United States surveyors have returned the summits and sides of about all the mountains in northern California as agricultural land. On this same land hundreds of miners are now at work, with no defined law under which to bold claims.

It is just as much trouble to locate mining claims on Government or even sections as on the railroad sections. On even sections he must have a paying mine to establish claim; a good prospect will not do.

On this matter reference is made to decisions of the land department at Washington. An examination of this land and a reclassification must he had before the quartzminer will have a right to pursue his occupation, only in a limited way. The peculiar manner the Southern Pacific Railroad Company has of doing business is becoming about as well understood as the tricks of the heathen Chinese. It sells sections of this mineral land without regard to how many miners occupy it; the one purchasing and the miners whose claims are on the ground can either fight or law for possession; this is no concern of the railroad company.

Let us hope the legislature will call upon Congress to remedy this injustice. J. E. BELL.

Acknowledgement and Reminiscence.

SAN FRANCISCO, Dec. 5, 1892.

TO THE EDITOR:—It is always gratifying to he appreciated; hence I take pleasure in acknowledging the graceful compliments of your correspondents, F. A. Garbutt and "M. H. B." The apparent immediate cause of the last named gentleman's tribute, however, is hardly worth the attention it has received. It takes all sorts of people to make a world, and the "James Smiths" are one sort. Moreover, it is good for us to "see ourselves as others see us," from different points of view, and old Æsop taught long ago the futility of trying to please everyhody. In truth, the narrow intelligence which can discern in the MINING AND SCIENTIFIC PRESS a *newspaper* only, is no more worthy of serious consideration than is the moral obtuseness which permitted to Mr. Smith the indelicacy of expressing his sense of disgruntlement to me, instead of to you, to whom was addressed the subject of his plaint; to you, who are alone the judge as to what is appropriate to the columns over which you so ahly preside, and alone responsihle for what may appear therein; for these reasons I ahstained from resenting what some might deem an impertinence.

My connection with this paper dates back more than a quarter century, and during all that time my relations with the proprietors and editors have been marked hy uninterrupted cordiality and mutual esteem. In the earlier years my writings were perhaps not remarkable for a "total lack of dogmatism;" that comes, or should come, with age and reflection. I was one among about a dozen contrihutors of whom I seem to be the lone survivor. Some of them have passed over to the majority; some seem to have retired permanently from the field, perhaps wisely, for, as one of the brightest, who went to his long home in the sixties, said to me, "A man who is fool enough to write for the public press must expect to be held responsible, not only for what he says hut also for what every idiot thinks he means." For my part, I write from a variety of motives, among which are, a love of the "art or trade" by which I have made a living these many years. If I do not give *quid pro quo*, which, for the benefit of friend James, I will say is equivalent to "a hlack dog for a green monkey," it is not from any desire to "steal an ad."

Many a sharp cut-and-thrust have I had in these columns with belted knights of the profession, who had oot the cue to cry "bodkin" to me;* and, after all, what does a piece of sheepskin signify? Simply that the owner did once know something! It does not prove that he has not forgotten, as Mr. Brown, the only man who ever knew it, unfortunately forgot what animal magnetism was, to the great disgust of his professor and his class; nor does it show that he has kept up with the march of science since the sheepskin was granted. Moreover, as Horace Greeley said of the runaway slave, "If he can pass for a white man, by God, sir, he *is* a white man!" These remarks necessitate another, to guard against erroneous inference, bane of the public writer. I am far from despising a diploma; it is at least *prima facie* evidence of qualification; I merely mean to say that a record of achievements in the field should he, and often is, admitted as an equivalent at least.

One hattle royal in particular I remember; it is not very many years ago. Sir George of the Delta, one of my dearest foes (and friends), aod myself made an unconcerted hut simultaneous denunciation ol a certain Patent which the sovereign of this country had granted to a knight called Sir Otto of Tarshish, as a reward for having vanquished in single combat a hydra-headed metallurgical monster in the country of that name. Sir Otto not being returned yet, his uncle, old Sir Guido, espoused his cause and, taking up the gauntlet, made a vigorous though rather ill-directed charge upon us. Sir George, seeing that we were two to one, retired, showing his high sense of the obligations of chivalry, as well as his confidence in my ahility to maintain the cause whicb we deemed righteous. After a couple of lively bouts hetween Sir Guido and your servant, in which neither side suffered much harm, Sir Otto, coming down from Tarshish, hearing the clash of arms and seeing his uncle sore put to it to hold his ground, at once took the elder knight's place and made a very potent onslaught, calling forth all the skill and valor of his opponent, even though Sir William of Ireland attempted a diversion hy skirmishing "on the side," on account of a grievance he had against Sir Otto, who had given him a poke in the ribs *en passant*.

At this juncture appeared upon the scene, coming to the aid of Sir Otto,

> "A warrior stout and tall;
> None could tell his name nor lineage,
> None could meet him in the field,"
> And the symhol, *Metallurgist*,
> Blazed upon his burnished shield,

And this nameless knight did such pithy and pungent work with his good lance that my hanner was humhled to the dust, and the cause I had defended was utterly lost. Sir Otto was naturally elated, and in his song of triumph gave due praise, as in honor hound, to his timely ally, the stranger knight. It was a little mean of me, I freely confess, hut I could not resist the temptation to reveal my identity with that nameless warrior.

It came about in this wise: As I lay one night in hed, instead of attending to the legitimate husiness of horizontal life, which, as I take it, is sleeping, I was turning over in my mind the suhject of my contention. As thus I revolved the matter, I caugbt sight of an aspect which I had not before observed, and, on meditating profoundly, decided that it was the proper aspect, and that I had been fighting an unholy fight. Now, Sir Otto had by no means tumbled to this weak spot in my armor, and I had parried or forestalled every attack so far; therefore I would not yield me captive to *his* spear, and yet as a true knight at heart, though not duly "dubbed," I could no longer sustain an unrighteous cause to the detriment of knightly honor and the prejudice of truth, so I took the only alternative and, disguised as the nameless knight, turned my arms against that which had been my cause and shared the glory of the victor. I fear Sir George of the Delta never quite forgave what seemed to him like treachery, but was in fact only loyalty to truth as I saw it.

Friends and foes of the old time and of tbe present, may Peace dwell in your tents! The time is not far distant when my voice also will be "heard to cease." Meanwhile, I shall go straight on, unmoved by M. T. pretensions or the "slings and arrows of outrageous" impudence, ever strenuously striving toward the unattainable goal of each true knight of Science or Art—*Pure Truth*.

C. H. AARON.

* Vide—The Abbott—Waverly Novels.

Where, O Where, Is He?

TO THE EDITOR:—My former letter about the cyanide process has been pretty roughly handled one way or another. That's all right, hut I am staying with the pot all the same.

I said I would believe in the process when I should see an honest miner made rich by working it, or having it worked for him. Now, that's a good while ago. I have heard lots about what people were going to do, but, I ask, respectfully, where is the man who has made any money out of the thing, barring hired men and sellers of rights.

Mr. C. H Aaron keeps firing away, but it seems to be all blank cartridge, and he can't make any bull's-eye that way. I notice he doesn't say a word about having worked any ore. Mr. Merrill, who is a "'varsity man," and our old friend Louis Blanding, and many others have had their say, and it all makes very nice reading for them that understand it, hut it seems to me there's a lack of the most important thing, which is, economic statistics of practical working. We fellows in the mountains have a saying, "Talk's cheap, but it takes money to buy whisky." But really it's a little hard sometimes to know whether Mr. Aaron is fish or fowl. At one time he seems to praise the process, and then again he finds fault with it. Well, I guess he knows what he's playing for. Perhaps he's on the fence, waiting like me for more light, though I stay on my side of the fence till I see something to climb over for.

Mr. Paul has not had much to say of late, and I notice that, for one reason or other, his mills do a good deal of stopping. If any one can tell us anything really valuable about the practical results of the process in this country, Paul is, or should be, the man. The Mercur mill is rather too far off and too much in with the Denver Co.; moreover, there are some who believe the reports from it to be "cooked." Small tests on a few pounds, or even a ton of ore, such as some gentlemen report, don't go for much with any PRACTICAL MINER.

P. S.—I hear that certain merry gentlemen have an itching to punch my head, if they can find me. Well, that used to be my trade, hut I'm getting old now and, like many others, I make a virtue of necessity and cultivate the ways of peace. Still, like the great ex-champion John L., "I can lick any man, if he will only stand still;" and, I will add, I can kiss any girl on the same condition.

AT times some difficulty is experienced in securing first-class mechanics under the operations of civil service, as such do not seem to regard a job at Mare Island Navy Yard worth the trouble necessary to register, as required by law, according to their trades. The only requirements for registration are that they shall be American citizens, and that they shall bring certificates from previous employers that they know their trade. The Board of Labor Employment at the Mare Island Yard consists of three officers, to-wit: Captain H. L. Howison, Chief Engineer George J. Burnap, and Lieutenant Daniel P. Menefee, recorder. When workmen in any particular trade are needed in any department of the yard, the head of the department makes a requisition on the board for the number required. The board then sends in a list of names, taking them in the order of their application, but giving preference first to veterans of tbe war, next to those having served apprenticesbip in the yard, then those having had experience in navy-yard work, lastly, those who have never worked at a naval station. The head of the department, on receiving tbe names from the board, takes the same course that would be followed by a superintendent in a private establishment. He sets the men at work and finds out their fitness for employment, grading them accordiog to their skill, if they are first-class men, if they are not rejecting them altogether. Every man who is sent to a department must be given a fair trial. If they do not come up to tbe standard they are sent back and a new set of names are sent in. The foremen have little or no jurisdiction in the selection of their men, though they have to judge upon the qualifications of those sent them.

THE South Yuba Canal Company has been quietly soliciting among the mines of Nevada City and Grass Valley, bidding to put in electrical power within three months. There promises to he a lively contest for the furnishing of power in that section before long, and the consumer may hope to get the better of it. Work on the Tregidgo electrical proposition is progressing favorably. The dam is about completed and capahle of withstanding the winter floods. This was the part of the work they were most solicitous of completing at an early date.

THE Florence, A. T., canal and all rights will probably be sold to a strong syndicate possessiog ample capital to develop to its fullest extent the water supply of the Casa Grande valley.

Mechanical Progress.

Horse Power of Boilers.

It is a very common thing to hear men connected with steam plants speaking of the horsepower of their boilers, yet if they were asked to define what they meant by horsepower of boilers, there is no doubt but many of them would suddenly discover that it was somewhat difficult to define clearly just what they did mean, and for a very good reason. Strictly speaking, says the *Wool and Cotton Reporter*, there is no such thing as horsepower to a steam boiler, and in consequence the term horsepower of a boiler is a very vague expression. But as boilers have been found so far a necessity in driving steam engines, the same measure applied to steam engines has come to be universally applied to the boiler, and like a good many other such accidental definitions, cannot very well be discarded.

The unit of horsepower for boilers is not fixed except by arbitrary agreement among the parties concerned, the basis differing according to the nature of the work done by the steam. Many boilermakers rate the horsepower of the boilers by the number of square feet of heating surface contained in the boiler. Although this rule is followed by many, it is no criterion as between different styles of boilers—a square foot under some circumstances being many times as efficient as in others; but when the average rate of evaporation has been fixed upon by experimenters in one boiler, there is no more convenient way of rating others of the same style. But by an outsider no exact rating of a boiler can be made from a knowledge of only its heating surface.

The following rules are observed in a good many boiler shops, and may be useful: For cylinder boilers nine square feet of heating surface per horsepower are allowed, for fine boilers 12 square feet, and for tubular boilers 15 square feet of heating surface per horsepower. Hence, if the total heating surface be known, divide it by 9, 12 or 15, according to the type of boiler, and the quotient will be the horsepower of the boiler. If a boiler is tested and a statement of its horsepower desired, without regard to whether it is to supply its steam to drive an engine or for other purposes, then it is agreed upon by the majority of experts to consider 30 pounds of water per hour, evaporated at 70 pounds pressure from 100 degrees, as a horsepower.

A standard was fixed by Watt at one cubic foot of water evaporated per hour from 212 degrees for each horsepower. This was at that time the requirement of the best engine in use. Most nations have a standard similar to and generally derived from Watt's horsepower, but owing to different standards of weights and measures, these are not identical, though the greatest differences amount to less than 1½ per cent.

Oil Motors for Launches.

Quite a large field has been opened out during the past few years for the employment of oil-engines for various purposes. Among such applications may be mentioned those for driving dynamos for electric lighting and general motors, or for mining and marine purposes. Since the first successful petroleum engine was introduced, some time ago, a very large number has been adopted, and this type of motor now constitutes a formidable competitor to the gas-engine. Probably this is due not so much to the actual cost per horsepower hour—which may be taken as approximately the same in either case—as to the fact that the oil-engine can be operated where the nonexistence of a supply of gas precludes the employment of a gas-engine. This is specially the case in many country districts, both at home and abroad, where petroleum is frequently the only available means of obtaining light and heat.

The Priestman oil-engine was the first—at least in this country—to be applied for the propulsion of launches, and this has been followed by the introduction of naphtha motors in Germany and Switzerland. In the former country the Daimler motor has been extensively adopted, and in Hamburg alone no less than 80 of these craft are running in and about the port. Refined petroleum is used in the Daimler, as compared with the heavy or crude oil employed in the Priestman engine. The Daimler motor is about to receive some prominence in this country, but in the meantime the Roots' gas-engine, which we described in a previous issue, has been developed. It is now equally applicable as an oil-engine, and, as such, one has been made, and has this week been tried in a launch on the Thames.

The trial was promoted by Messrs. Yosper & Co., of Portsmouth. The motor used weighed six hundredweight, developed something over three-horsepower, and drove the launch at a speed of six miles an hour. The novelty claimed for this engine consists mainly in the mechanical contrivances by which ordinary paraffine oil is converted into gas. A small reservoir containing two gallons of mineral oil, which is enough for a run of three hours at full speed, is attached to the engine. From this, one drop at a time descends through pipes to valves, into which heated air is admitted. The air and oil are forced into a space, which, by contact with the flame from another jet of oil is kept always at an even temperature. There the oil is converted suddenly into gas, and passes through a tube to the cylinder. By a system of compensating valves, on which a lever strikes, gas is admitted into each of two cylinders alternately, and the motion once begun goes on so long as there is a drop of oil left in the reservoir, unless it is desired that the engine should stop, and then the man in charge has it perfectly under control. At the trial the engine seemed to work efficiently. When it is desired to stop altogether, the propeller is thrown out of gear. Engines of considerably more power are in course of construction, but the idea at present is to adopt them simply for use in launches or boats of similar size.—Invention.

The Use of Steam Jets.

One of the most varied and successful applications of steam jets may be seen at a well-known mill in this city. After several years of use of natural gas, the owners were forced to return to coal. They found, however, that with coal their boilers would not supply sufficient steam. Accordingly, they concluded to try steam jets to increase combustion and evaporation. After some experimenting they finally adopted a jet somewhat of the Bunsen burner type, which is now in successful operation on two batteries of fine boilers—the jets being placed above the fire doors and immediately below the boilers. The fuel is slack, and yet almost no smoke is visible, even during heavy firing. The same firm has also applied to 18 puddling and four heating furnaces steam jets of a different design. In these the ash pit is made tight and the steam and air enter below the grates. These furnaces are of the usual type, except that special openings are made for air above the fire and through the bridge-wall. When the fire doors are closed no black smoke is visible while the steam jets are in operation. The smoke appears above the stack whenever the fire door is opened, but disappears immediately on closing the door. Each puddling furnace has two jets of steam and each heating furnace five jets, all about one-tenth inch in diameter. Not coal can now be used in the heating furnaces and slack in the puddling furnaces, whereas lump was used formerly in both. The jets have been in use nearly a year, and the millowners state that they have not injured the boilers nor the furnaces, nor the iron, but have saved money by reducing the quantity and quality of the fuel required. Unfortunately the steam jet makes a great noise. This is not very objectionable in a rolling mill or machine shop, but will probably prevent its introduction into office buildings where it otherwise might be useful.—Iron Age.

Asbestus Porcelain.

M. Garros is the inventor of a new substance, somewhat resembling ordinary porcelain, but which possesses, as he claims, many advantages over that substance. The fibers of asbestus are exceedingly fine, their diameter varying between .00016 millimeters and .0001 millimeters, and consequently an exceedingly fine powder can be obtained from these. If it were possible to amalgamate these small particles without the addition of any foreign substance, it is evident, says the *Electrical World*, that a substance could be obtained which would be porous in nature, but the pores so fine that they could hardly be seen under the microscope. This substance is formed by pulverizing the asbestus, a process which is rather difficult if the ordinary mortar is used, but which is comparatively easy when the proper apparatus is employed.

From this powder a paste is made by mixture with water, and this paste is kneaded, diluted with water, dried and kneaded again, and then molded into the proper form. By heating the objects in a crucible to a temperature of 1700° C., a porcelain is obtained with a translucency comparable to that of ordinary porcelain, and for this reason the inventor has given the name of asbestus porcelain to the substance. If it is heated for 18 hours at a temperature of 1200° C., then porous asbestus porcelain is obtained of a light yellow or white color if care is taken to wash the asbestus powder with sulphuric acid. Prof. D'Arsonval states that porous cups made of asbestus porcelain used in electric batteries have much less resistance than the ordinary porous cups, and it has been found that this substance is about 2.75 times a better insulator than the porcelain in common use at the time.

Scientific Progress.

The Science of Smelling.

Prof. De Volson Wood, of the Stevens' Institute Hoboken, N. J., contributes the following to *Science*: The greater part of the science of seeing is contained in the science of optics, and this is founded upon the theory of undulations of the ether and the way in which they are modified by the media through which they pass. The form of the surface, whether plane or curved, as well as the density of the medium, produces marked effects.

Similarly, the greater part of the science of hearing is contained in the science of acoustics, and this also treats of undulations, or waves propagated in air or other gases. It is not believed in either case that solid particles pass from a source to the sensitive nerves to produce the particular sensation.

Why should there not be a science of smelling? The principal part of such a science would consist of an investigation of the mechanical properties of odors, and might briefly be called "Odorology." Is it not highly probable that odors are also propagated by undulations of an ether? And yet we are familiar with the statements made by writers, such as "A grain of musk will keep a room scented for many years. During the whole of the time it must be slowly evaporating, giving out its particles to the currents of air to be wafted presently out of doors; yet in all this time the musk seems to lose but little of its weight." "The acute sense of smell of the dog is well-known; for he can detect the track of his master long after the tracks have been made, which shows that some slight characteristic matter is left at each footfall."

Those who thus speak impart the idea that odor is material. I prefer to think of it as a property of matter, which produces its own peculiar undulations; and that the sensation of odor is produced by these undulations in the olfactories. Musk retains this property for a very long time, while some bodies lose it rapidly. The man may leave some characteristic matter on the ground at each footstep, but it is not necessary that particles of that matter shall pass from the ground into the nose of the dog in order that he may track his master. It is only necessary that that matter shall possess the property of sending forth certain undulations. Indeed, it is not difficult to conceive that the ground itself has imparted to it the property of sending forth the desired undulations.

These facts being assumed, investigations might be made to determine the velocity with which odors are propagated, and whether they are subject to reflection, refraction, and interference, and other properties common to sound and light; also whether the different odors are due to different wave-lengths, and if the strength and intensity of the odor is due to the amplitude of the wave, as in light and sound. The physiological qualities of the olfactories by which they enable one to detect odors of different qualities and intensities, furnish a field for the most delicate and refined investigation.

The Value and Preparation of Magnesia.

Magnesia, formerly chiefly valued on account of its medicinal properties, has recently risen to great commercial importance, owing to its infusibility and its employment as a lining for converters used in the basic process of steel manufacture. Caron, whose process was in the first instance followed, used calcined magnesite. This was made up with one-sixth of its weight of tender-burned magnesia, and from 10 to 15 per cent of water, into a plastic state; it was then compressed into bricks in iron molds and burned at a dull-red heat. Professor Ehrenworth has pointed out that, if the refractory properties of the magnesia are to be evoked to the full, it is of the utmost importance that the whole of the magnesia should be dead-burned; the process, moreover, being carried so far as not only to expel the whole of the carbonic acid, but also to cause the full amount of shrinkage which this material is capable of attaining. This extreme amount of calcination is very difficult to effect, owing to the tendency of the magnesite to fly into splinters, and to drop to pieces when subsequently touched, and in consequence of its being such a bad conductor of heat the stone is very hard to burn in large pieces.

Recently dolomite, which is a double carbonate of lime and magnesia, has been used instead of magnesite. In order to prepare this material there are two processes before the public; that of Closson and that of Scheibler. Under the former plan, the calcined dolomite is mixed with chloride of magnesium, the chlorine in which separates from the magnesia and combines with the lime, yielding a soluble calcic chloride which can readily be washed out, leaving behind the insoluble magnesia. Under the process of Scheibler, the calcined dolomite is treated with dissolved sugar, leading to the formation of sugar of lime, and depositing the magnesia. The solution of sugar of lime is then exposed to carbonic-acid gas, which separates the lime as a carbonate, leaving the sugar ready for reuse. Both these systems of producing magnesia have the advantage of relative cheapness in their favor, owing to the low price of dolomite. Professor Frank of Charlottenburg has advocated the use of magnesia as a substitute for plaster of paris for casts; and Grundmann has recently shown the advantage of employing a mixture of magnesia and powdered marble for this purpose. The latter has found, following the direction given by Hirzel, that a mixture of benzol and magnesia is the very best possible substance for the removal of grease from drawings, or from any other material.—Iron.

THE PHONOSCOPE.—In a recent number of this journal was announced the fact that M. Dumeny had succeeded in taking instantaneous photographs of the lips of a speaker, and is recombining them in a sort of zoetrope, so as to reproduce the original movements, and enable a deaf mute to understand what was said. He has recently improved on the process, and invented a new apparatus for combining the images, which he terms a phonoscope. The changes of the lips in speaking are so rapid that 15 photographs a second are required to give a good result. Moreover, several sets of images for the same phase are taken, so that nothing essential should be omitted. The whole head and bust of the speaker is photographed, so as to get the benefit of the expression. In the phonoscope the positives are arranged around the periphery of a disc, which is rapidly turned by a handle. A second disc, having a single window in it just opposite the plates, is also rotated by the same handle, but at a much higher speed than the other. A beam of sunlight illuminates the plates from behind, and the observer, looking into the apparatus, sees them pass his eyes one after another in such rapid succession as to produce the effect of a single image endowed with animation. To this end, at least 10 or 12 must pass the retina in a second. M. Dumeny is so far satisfied with his results that he looks forward to a time when we shall possess veritable "speaking likenesses" of our friends. In short, the family album will be a kind of phonoscope, and contain photographs which will not only smile, but speak, or appear to speak to us, as though they were alive.—Machinery.

LEAD COATED METAL PLATES.—From the experiments thus far made, says an exchange, it would appear that the new process of coating iron and steel plates with lead is likely to inaugurate an important industry. The plates or other articles to be coated are first pickled in a bath to remove scale, and through this bath a weak current of electricity is passed, which is said to reduce the time required by one-third. From this bath the articles are passed, as usual, into another of lime water, which neutralizes the acid, and thence into a third of clear water; they are then immersed in a fourth bath, consisting of a neutral solution of zinc and stannic chlorides, obtained by dissolving granulated zinc and tin in hydrochloric acid; and from this bath they are passed into a drying chamber, heated by steam, where the moisture on them from the last bath is evaporated, leaving behind a deposit of the mixed metallic chlorides, which protects the plates, etc., from oxidation, and, when dried, these plates are ready to be placed into a bath of molten lead. On issuing from the bath, the plates are found to be coated with a uniform and very adherent layer of lead, and, though perfectly uniform, the layer is nevertheless very thin. The ductility and strength of the iron are not diminished by the process, and a plate can be bent and closed, and again opened out, without breaking the coating. In the case of galvanized iron, bending the plate to a sharp angle causes the coating to crack.

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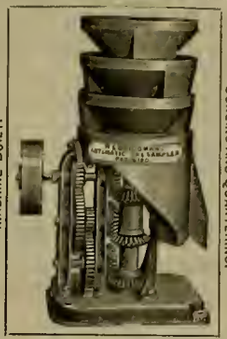

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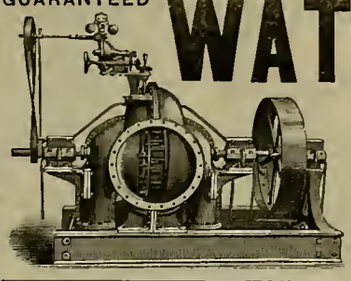

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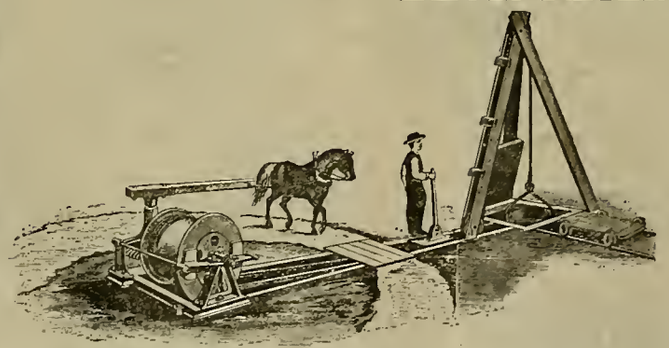

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The following abstracts from the report of the committee on "A Model Electric Street-Railway Roadbed and Underground Wiring," which was made at the recent Cleveland convention, contains valuable information worth keeping for reference:

We bave heard of instances being cited where copper wire laid nnderground was more susceptible to electrolysis than that of galvanized iron or steel; but after a thorough trial of upward of three years, during which time we bave used botb, the conclusion reached is that copper, being not only a better conductor but less liable to corrode and break, is therefore the best wire to use for underground work. Galvanized soft steel or iron wire used for this purpose had not proved durable, and we have found the same to be entirely eaten away by electrolysis where it had come in contact with the crosstie, and in perfect condition elsewhere.

By careful examination of the ampere meter at the powerhouse during dry weather, compared with that of rainy weather, it will be noticed that tbere is a marked decrease in the amount of current used in favor of the latter; hence i: follows that the more connections to the rail and the opposite poles of the generator with the moist earth the more economically is the system operated. It must also be remembered that the increased saving in current in wet weather over that of dry weather is not attributable to the increased moisture of the eartb alone, but to the fact that the dust and dirt, which readily finds lodgment on the rail, is washed off, and many roads now in operation by electricity have found the use of a car equipped with a tank having one down-spout, about ⅝ inch in diameter, on each side, so arranged as to permit a stream to flow over the head of each rail, most advantageous. These down-spouts should be located as near the wheel as possible, in order to insure the same being directly over the rail at all curves, as well as the straight track.

The mistake is sometimes made in designing and equipping a new road, or in changing from animal traction to electricity, of neglecting the track construction by appointing the amount to be thus expended to such a sum that, in order to make both ends meet, it becomes necessary to weaken that portion of the investment where, above all others, strength and permanency are required.

The switches, or cross-overs, should be located at such points along the route as will best provide for the following contingencies: bunching cars for large gatherings, and to insure the constant operation of cars during fires, parades and all other blockades when, from any cause, the terminus of the road cannot be reached. They should never be placed with the switch point against the traffic, and, preferably, on up grades, thus enabling cars to cross to the opposite track by gravity.

The fact should be borne in mind in the selection of cross-ties, not only to keep in view the selection of such timber as is calculated to insure the longest life, but due consideration should be given to the particular kind that will best hold the spike; and for this reason the white oak possesses advantages that should merit its consideration.

The requirements of a rail for electric traction are strength, joint connections, durability. In some localities there are municipal requirements specifying what the head of the rail shall be.

For strength we rely chiefly on the weight of the rail and the thickness and depth of the web.

For joint connections that rail which affords the best method of keeping both ends of the rail in perfect alignment is the best, and as the girder rail possesses peculiar advantages in this respect its almost universal adoption is due to that fact.

For durability we depend on the height of the head of the rail at the gauge-line over the lower flange, and the quality of the metal.

Electric Riveting.

Electricity has come into play in about every branch of mechanics, and it is not surprising that riveting by electricity is a success and an important improvement in the industrial arts. The apparatus consists of a transformer, the primary of which is formed of a heavy copper bar laid parallel to a coil of fine wire, and over the two are clamped angular segments of iron, forming when united a completed iron shell, increasing by this arrangement the efficiency of conversion. The structure creates a current of great volume in the copper bar, and in the end of this bar are mounted an anvil (having a regulating screw for moving it up or down) and a follower provided with a screw. In the circuit of a primary is placed a choke coil provided with a regulating switch for cutting in more or less of the coil by which the strength of the current induced in the secondary may be controlled.

Tbe bars or pieces of metal are placed upon the anvil and the rivet dropped in place, the anvil being tben screwed up until the plates of metal are firmly held between it and the two insulating legs secured to the upper limb of the copper bar. The face of the bar is covered with insulating material, except at a central point where it is left bare; and when forced against the rivet, the latter establishes connection from the upper limb or the primary bar to the lower limb, the current developing sufficient heat to make an upsetting of the rivet shank very easy under the pressure of the screw.—American Manufacturer.

Storage Batteries.

The secondary battery absorbs and stores energy electrically transferred to it.

The passage of a current of electricity through the dilute sulphuric acid between the plates of a secondary cell decomposes that liquid into its constituent elements, oxygen and hydrogen. In this manner the positive plate or plates become oxidized and the negative plates hydrogenized, the capacity of the oxygenation being equivalent to the storage capacity of the secondary battery. When pure lead is employed for the electrodes the process of oxidizing is very slow before an appreciable return can be obtained, and the cells bave to be frequently reversed in charging to make the positive plates spongy by hydrogenizing them, so tbat the degree of oxygenation may be great at the next reversal and the capacity of the cell increased.

This process is called "forming" and when completed the accumulator so made is more satisfactory than when an oxide is used in the form of a paste. Red lead, or litharge, are the usual oxides of lead that are employed. It is pressed in the form of paste into a grid, or frame, several of which area arranged alternately and coupled in parallel within a water-tigbt box to form a cell. The storage capacity depends upon the area of the lead surface immersed and the internal resistance upon the distance that separates the plates. The internal resistance is reduced by placing the plates closely together, using strips of glass, or other insulating material, to separate tbem.

Tbe process of forming is considerably curtailed when there is an oxidized and spongy surface to start with.

Recharging a completely discharged accumulator produces no other visible effect than to slightly disturb the liquid; but when tbe storage capacity is nearly attained bubbles are freely given off, caused by the evolution of hydrogen gas. A discharged accumulator should be immediately recbarged, as the sulphate of lead formed by the action of the sulphuric acid upon the nonactive surface of a discharged cell is injurious.

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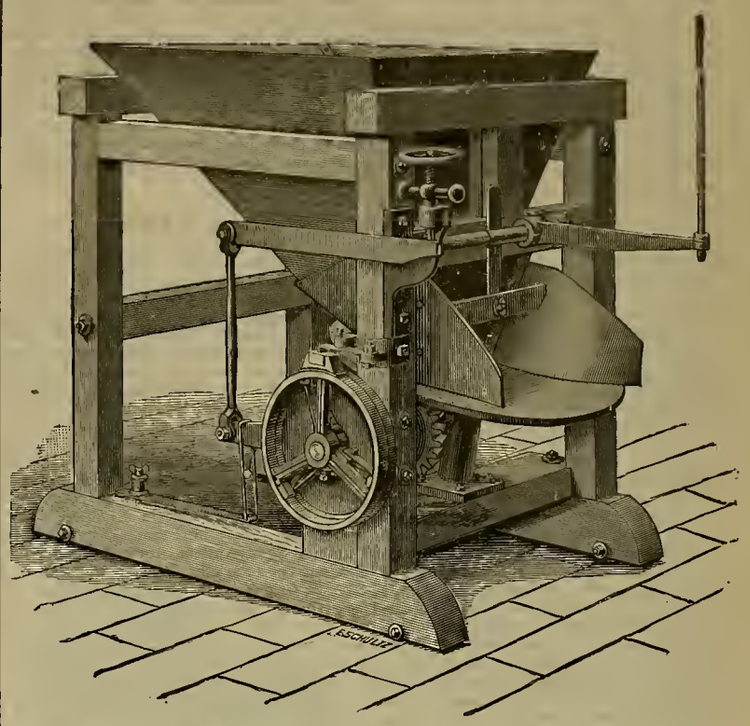

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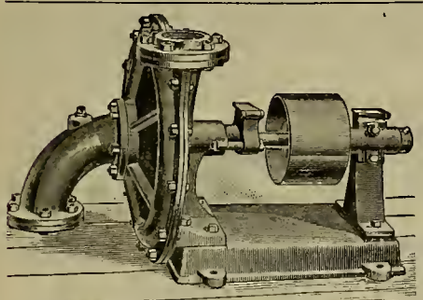

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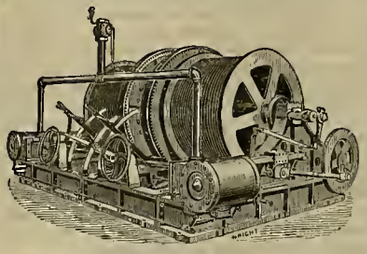

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Useful Information.

Value of Magnesium as a Source of Light.

Mr. Frederick J. Rogers, as the result of what he terms a series of patient investigations, summarizes his researches in respect to the above as follows: (1) The spectrum of burning magnesium, as has already been pointed out by Pickering, approaches much more nearly that of sunlight than does the spectrum of any other artificial illuminant. (2) The temperature of the magnesium flame, about 1340° C., lies between that of the Bunsen burner and that of the air-blast lamp, although the character of its spectrum is such as would correspond to a temperature of nearly 5000° C., were its light due to ordinary incandescence. (3) The "radiant efficiency" (the ratio of luminous energy to total radiant energy) is 13½ per cent, a value higher than that for any other artificial illuminant (excepting, perhaps, the light of the electric discharge in vacuo, for which Dr. Staub, of Zurich, has found an efficiency of about 34 per cent). (4) The radiant energy emitted by hurning magnesium is about 4630 calories per gramme of the metal hurned, or 75 per cent of the total heat of combustion, as compared with 15 per cent to 20 per cent in the case of illuminating gas. (5) The thermal equivalent of one-candle power minute of magnesium light is about 2.5 lesser calories, as against 3.5 to 4.0 for other artificial illuminants. (6) The total efficiency of the magnesium light is about 10 per cent as compared with a quarter of one per cent for illuminating gas. (7) Taking into consideration the greater average luminosity of the rays of the visible spectrum of the magnesium flame, it is certain that per unit of energy expended, the light-giving power of burning magnesium is from 50 to 60 times greater than that of gas. —Engineering and Mining Journal.

The Care and Cleaning of Marble.

Marble, which is much less used than heretofore, has fallen somewhat into disfavor because of the difficulty of keeping it in order. It will become stained and spotted, and the average housekeeper seems not to understand how to put it in proper condition.

Grease spots are especially disfiguring, and stains are given up as hopeless. The first step in cleaning marble is to wash it thoroughly with clean water and a soft cloth. Every particle of dust, dirt or gumminess should be removed; then for the treatment of stains there are various methods. Some strong acids will remove such, but they are dangerous to use, as they will eat holes in the marble by dissolving the elements of which it is composed. Paint may be removed by pouring a quantity of chloroform over the spot and holding it in place by a thick cloth of linen or cotton.

It is said that blotting-paper saturated with chloroform laid over paint spots will absorb them, at least will so dissolve the ingredients that they may be washed out by sopping them up with the cloth and water. When the colored particles are taken out the oily portion is quite likely to come with it. If not cleaned, apply more chloroform.

Almost hopeless-looking paint stains have been entirely removed in this way without leaving a spot. If the marble is only ordinarily soiled or discolored, make a paste of common baking soda and water. Spread it thickly over the marble and allow it to stay for some hours, covering it with a damp cloth so that it will not dry too quickly. Leave it on over night; the next day wash thoroughly with clean water and polish with a bit of old wool-cloth or felt.

If marble is carefully washed once or twice in a month it rarely becomes dull or spotted unless by some accident, but when neglected it seems to grow spots, and becomes gray, and loses all of its brilliance and fine finish. —N. Y. Ledger.

PUMICE STONE.—We often hear it remarked, and particularly after the eruption of a volcano, that pumice stone ought to be plentiful and cheap, as quantities must have been ejected during the volcanic disturbance. As a matter of fact, however, none of the white stone in general use is obtained from active volcanos. It comes from deposits of the article discovered in one or two quarters of the globe, the best of which is at present to be found in the island of Lipari, situated in the Tyrrhenian sea. The island is mountainous in character and consists of tufa and lavas and highly siliceous volcanic products. The district where the stone is found is called Campo Blanco or Monte Petalo, 1500 feet above the level of the sea. After riding a considerable distance, partly along precipitous paths sufficiently dangerous to be interesting, and partly through vineyards and over grassy plains, one almost suddenly comes upon a seemingly snowclad narrow valley, inclosed by hills, also quite white, and the whole glaringly bright on a sunny day. Into these hills workmen are ceaselessly digging deep burrows, working within by candlelight. In their excavations they come across many lumps of pumice stone which are placed in baskets, subsequently being conveyed along the valley to the seashore, where small boats are loaded and sailed to the seaport near by, where the stone is sorted, packed and shipped to distant parts, either via Messina or Leghorn.—Builder and Woodworker.

Wages in Europe.

Blacksmiths receive $9.62 per week in England, $4 in Germany, $5.81 in France, $5.38 in Belgium, $3.18 in Austria. Carpenters receive $9.75 in England, $4.11 in Germany, $6.20 in France, $4.07 in Belgium, $5.10 in Austria. Cabinet makers receive $6 22 per week in England, $4.25 in Germany, $6.14 in France, $5.66 in Belgium and $4.40 in Austria. Machinists receive $9 per week in England and $4 60 in Germany—no figures at hand for France, Belgium and Austria. Painters receive $8.92 per week in England and $4.82 in Germany—no figures as to other countries. Laborers, $5.29 per week in England, $3.11 in Germany, $3.93 in France, $3.77 in Belgium and $3 in Austria. Printers are paid 20 cents per 1000 ems in England, and receive $6.64 per week in France, $5 94 in Belgium and $3.95 in Austria; bricklayers, $7.75 per week in England, $4.21 in Germany, $5.74 in France, $4 56 in Belgium and $3.55 in Austria; masons, $8 per week in England, $4.07 in Germany, $5.33 in France, $5.22 in Belgium and $3 73 in Austria; farm laborers, $3 per week in England, $3 06 in Germany, $3.10 in France, $2.72 in Belgium and $3.50 in Austria; coopers, $6 in England, $3 97 in Germany, $5.58 in France, $5.17 in Belgium and $3 64 in Austria; shoemakers, $6 per week in England, $2 95 in Germany and $2.90 in France.—Report of the Bureau of Labor Statistics.

THE ADVANCE OF STEEL.—The advances made in the last few years in the metallurgy of steel suggest possibilities that have heretofore hardly been imagined. The manufacture of armor plate of nickel-steel, and the treatment of it by the Harvey process and by oil-tempering, has resulted in a product so tough that it is very difficult to tool it, and a nickel-steel specimen has been tested by pulling, which gave, with 98,000 pounds tensile strength, 42 per cent elongation. A rail made of this kind of steel would be practically indestructible. It would cost a good deal more than any chief engineer would dare recommend. Railway directors would not be justified in considering posterity so far as to spend a company's money for such rails; but between a nickel-steel oil-tempered rail and the ordinary steel rail of commerce there is a line of greatest economy which has not even been approximated in rail-making.

WASTING TIMBER.—Eastern lumbermen visiting this coast express actual sorrow at the great waste evident here in the manufacture of lumber. In their own districts they have been for years reducing the amount of waste and utilizing the odds and ends. Comparing the amount wasted here with that in the East, they have no waste; still, they think they do, and are constantly devising plans to work up what is now wasted. An Eastern writer figures the loss from log to lumber in the white-pine mills from one-quarter to one-half of its cubic contents. He says that in the California mills the waste is from 60 to 62 per cent. No figures are given for the mills of Oregon and Washington, but they are in it on the waste question, and must continue to be until a denser population calls for the small articles that can be manufactured from what is now thrown away.—West Coast Lumberman.

THE HIGHEST CHIMNEY ON THE CONTINENT.—The highest chimney in Germany and probably on the Continent has just been built at Stolberg, near Aix-la-Chapelle. It is 407 feet high, and it stands, moreover, on an eminence which rises some 270 feet above the surrounding plain. The inside diameter of the stalk is, at the bottom, 16 feet 8 inches; at the top, nearly 10 feet. The chimney, provision for the ascent of which has been made by fixing iron stips in the masonry, has occupied six months in erection, and the work was carried out wholly without accident.

IT is said the wood on the north side of a tree will not warp as much as that on the south side; and that if trees are sawn in planes that run east and west, as the tree stood, they will warp less than if cut in the opposite direction. However this may be, it is certain that the tendency to warp when sawn into boards is much greater in green than in dry wood, and the convex side of the curve is always towards the heart. This warping, due to unequal shrinkage, and to the more open texture of the external portion of the tree, is not found to occur in the middle plank or board of the log, excepting as it may, in slight degree, reduce the breadth.—Canada Lumberman.

ARMOR-PLATES.—The heaviest armor-plates yet placed on an American warship are those just secured to the sides of the "Indiana," now building at the Cramp shipyard, in Philadelphia. These plates are made of nickel steel, are 14 inches thick, 6 feet high and 16 feet long, and weigh 26 tons each. The side armor of this ship will be 18 inches thick, and each plate will weigh 46 tons. The first named plates were forged at the shops of the Bethlehem Iron-works, and they cost $15,000 each. Diagonal plates of the same thickness as those just put on the "Indiana" have also been shipped from Bethlehem for the sister ship "Massachusetts."—Engineering News.

INSPECTOR-GENERAL DUMONT, of the U. S. Steamboat Inspection Service, reports to the Secretary of the Treasury that the number of persons carried on steamboats last year was 6,650,000,000. The number of lives lost was 200, or 138 less than in the previous year. Of the lives lost only 48 were passengers, the remainder was made up of officers and crews.

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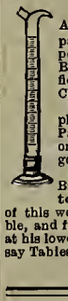
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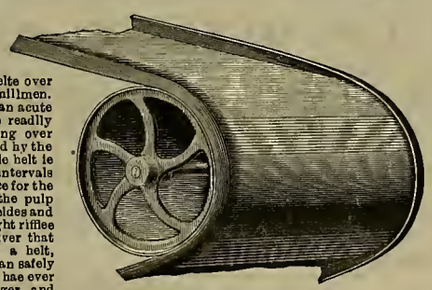

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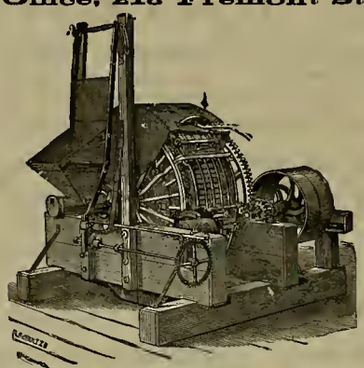
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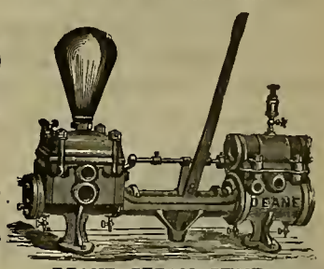

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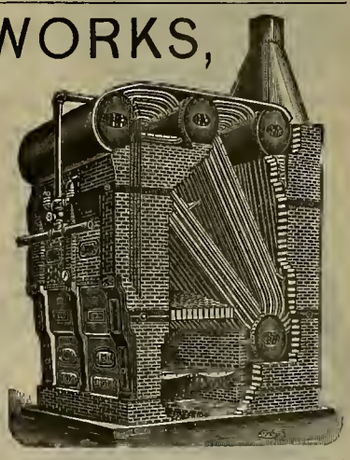

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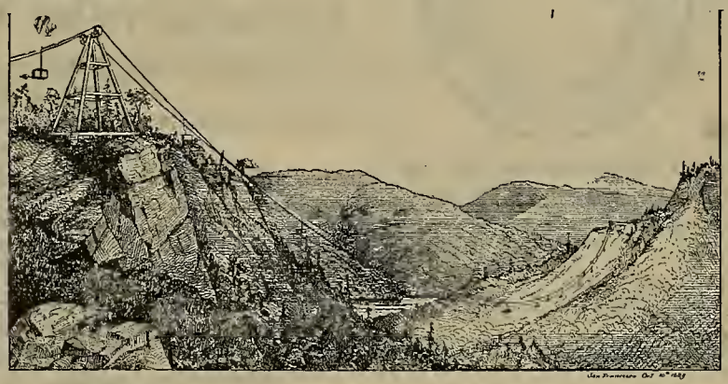

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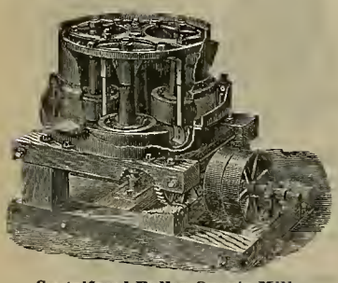

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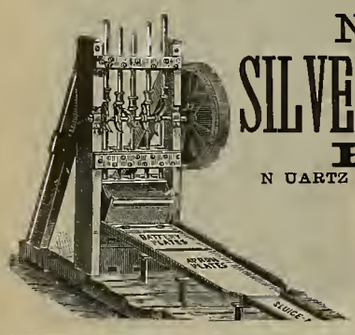

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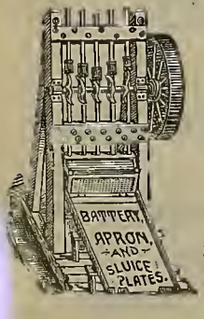

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Mining Summary.

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CALIFORNIA.

Amador.

HAARENBURGH.—Amador *Ledger*, Dec. 3: It is reported that A. Hayward has taken an interest in this property, and that consequently a thorough prospecting will be made. The shaft is 600 feet deep. Some fine ore has been taken out, but the ledge is small, and it is now necessary to go deeper, the expense of which is too heavy for those who have been operating the property for the past two years. There is strong reason for believing that the mine will improve when increased depth is reached. It has every appearance of being on the main gold-bearing ledge—the same formation as the Kennedy, Keystone, Eureka and other great bullion producers of the present and past. To explore it to the depth of 800 or 1000 feet is necessary to form a correct idea of its value, and the prospects are favorable that this will be done.

MISCELLANEOUS.—Something over one-half the pipe for the Zeile mine, to convey water from the ditch to the mill, is delivered on the ground. The storm will delay matters to some extent. It was the intention to lay the pipe at once, but whether this can be done now is problematical. The volume of water in the south fork—which has to be crossed—is too great to be controlled. The pipe, however, has to be tarred, and ditch made, and probably by the time this work is done the creek will have receded to its usual limits. At the Clinton Consolidated, J. B. Francis and W. J. Nettleare still employed as superintendent and foreman respectively. Mr. Rogers is in charge as general manager, in the place of D. Gutman. Sylvester G. Spagnoli, who has been deputy county clerk for many years, retired from that position on the 1st instant, and will devote his attention to placer mining at Clinton. He has some six acres of virgin placer ground, which is believed to be rich. The heavy rains have insured an abundance of water for mining purposes, and he proposes to work the ground this winter. George Thomas and I. N. Dewitt shipped a carload of rock from the Amador Queen to the city a week ago. They went down themselves a few days thereafter to see about their pay for extracting it. Stirnaman & James lately shipped 3500 pounds of ore from their claim near West Point bridge to San Francisco, and the returns amounted to $800.

Butte.

HE STRUCK IT RICH.—Chico *Chronicle-Record*, Nov. 30: Yesterday we had the pleasure of meeting the happiest man in Butte county at the present. He is R. S. Mundy from the forks of Butte creek. The storm is the indirect cause of his joy. Mr. Mundy is a miner and prospector, and has done a great deal of hard work along Butte creek with little more than a bare living as his returns. But on Tuesday morning his luck turned. Mundy has for some time been working a little claim on West Butte when there was water to be obtained. His claim is situated a short distance from C. W. Platt's place on West Butte, but his cabin is some distance below his claim on a high knoll. Between the cabin and claim are several little gullies, which, when it is raining, are torrents, and are dry during the summer. While crossing one of these torrents on Tuesday morning, Mr. Mundy, out of pure curiosity, took his shovel and threw up a little dam across the small stream, and, as he threw one shovelful of dirt from his shovel, he was overjoyed to find a nugget of gold worth $44 65. Thinking that where this nugget came from there were others, he began operations and search right there. He worked upstream on the sides of the gully, and, about 150 yards up the runway, found the edge of a small vein of decomposed quartz and sulphurets which was thickly studded with gold, and which he is fully satisfied is the parent ledge from which came the nuggets which he found. He says that he would almost bet his life that this ledge contains a series of rich pockets. He is so certain of this that he says $10,000 would not buy his find.

THE RIVER MINING DAME.—Oroville *Mercury*, Nov. 30: The Feather river booms! All of yesterday it rose steadily and this morning the rise was phenomenal even for this most erratic of streams. From seven o'clock this morning until ten the rise was seven feet, since which it has averaged about a foot an hour. Considerable anxiety being evinced by citizens regarding the effect of this vast amount of water on the Golden Gate and Golden Feather mines, a *Mercury* reporter interviewed Colonel McLaughlin, the manager of the mines, at his office. "The damage done by the sudden and heavy rise in the stream is merely nominal and hardly worth mentioning," he said. "Exclusive of the injury done to the telephone lines by the winds, the damage will not exceed $150. Only about 150 feet of old flume, which we did not think worth trying to save, has been carried away. The bed of the stream was stripped of all appliances several days ago, and we are in a position to resume operations next year at practically where we left off this season. Of course it goes without saying that the dams of both claims have stood the tremendous test nobly. The volume of water pouring over them and over the cement wall of the Golden Feather canal is a veritable Niagara. But the dams stand it without a quiver, and their stability is doubly assured after the sudden and almost unexpected test. The vast quantity of drift wood that has passed down the stream in the past few hours does not come from the mine, but from the mountains above, and passes over both dams." Apropos to this statement of Colonel McLaughlin's regarding the slight damage done by the sudden rise in the Feather at the river mines, it might be well to call attention to the fact that it is probably the first time in the history of such mining in California that complete and utter ruin did not follow the first freshets. This was true of the old Cape claim, the Union Cape, and in fact all of the mines of like nature on the Feather river. Thousands of dollars were lost and everything washed away.

Kern.

NEW MINING DISTRICT.—Inyo *Index* Nov. 30: During his visit here last week, Mr. F. S. Raymond of Freeman, Kern county (better known as Coyote Holes) gave an interesting account of very promising mining prospects in that section. The mines are in the Argus range, about 30 miles east of Coyote Holes, and are reported as extensive quartz lodes rich in free gold. W. C. Wilson and others of Mojave are preparing for working the new mines, and have already shipped in lumber for buildings and iron pipe for carrying water. The Argus range has long been regarded as a promising field for prospectors, and now that a start has been made, is likely to develop into a rich and extensive mining district.

Nevada.

THE CENTENNIAL GRAVEL MINE.—Virginia *Enterprise*, Nov. 30: In consideration of the impending storms of winter, which are heavier in Nevada county, Cal., where the mine is located, than here, the management has concluded to shut down for awhile. During the past year they have developed over 600 feet of good pay gravel, running across the famous old "Blue lead"—in fact, needing no more gravel. It has taken many years at an expense of $300,000 to arrive at this successful result, which has been achieved almost solely by Comstockers—Gold Hill and Virginia. The last assessment paid up all bills and left plenty in the treasury for future operations. As soon as spring will allow, a matter of a few weeks the proposed sluices will be put into position beyond the danger of wintry snowslides or freezing obstructions, and dividends instead of assessments will necessarily constitute the future programme of the Centennial.

HOISTING WORKS BOARED — Grass Valley *Telegraph*, Dec. 2: Last night the hoisting works belonging to the Alpha Mining Company, situated near the Idaho mine, were burned. The works have not been used for a very long time, and there was nothing of value in the building. Probably some tramp took refuge there during the storm, and was careless with fire. The loss is small.

Shasta.

INTROAAL QUICKSILVAR MINE—Redding *Free Press*: Frank Lindsay came down thie week from the Integral Co.'s works at Cinnabar, where he and Harry DePew were engaged in putting in a furnace for smelting quicksilver ore. Mr. Lindsay informs us that the furnace erected was the Knox patent, used at the celebrated Almaden mines, and has a capacity of 30 tons per day. This is the first of several to be erected later on, as soon as spring comes. The mine is close by, and the company has a store 24x30, a sawmill in operation, excellent quarters for the men and good grub. In fact, Frank speaks very highly of the management. Some 30 men have been employed, principally carpenters and laborers. Eleven men came over the mountain trail this week and experienced quite a hard trip, encountering about five feet of snow on the summit. The works will be closed down for the winter, but things will boom in the spring. The Integral camp is about 17 miles from Castella, over a trail. A packtrain with supplies has been running over there for some time, but the heavy machinery has been conveyed from Redding via Trinity Center. A large consignment of quicksilver flasks has just been received from the East. Mr. Lindsay will return in the spring and assist in the erection of several more furnaces.

BUNKER HILL MINING PROPERTY.—Our contemporaries have been publishing an item to the effect that Bill Murray and Vet Hull had bonded the old Bunker Hill mine on Middle creek, which in years past yielded large quantities of gold. We interviewed Mr. Murray Thursday, and learned that he and Mr. Hull had indeed secured a bond on 48 acres of the property for the term of two years. The bond was signed by Mrs. James Loag, who owns a half of 20 acres, Mrs. Carmichael (daughter of D. D. Harrell, deceased), who owns a fourth, and Daniel Lynch and J. V. Scott, who own another fourth—20 acres in all; then the signatures to the bond were obtained of Bob Kennedy, who owns 18 acres, and Peter Cusick, who owns 10 acres, the bond covering in all 48 acres, owned by those persons mentioned above. Mr. Murray informs us that he has prospected the ground recently, and that it shows up rich. For two years he has been figuring on this property, a bond to which he has at last succeeded in securing, assisted by Vet Hull.

THE SOUTH FORK PLANT.—W. W. Robinson of Igo informs us that from tests made there is no doubt but that the plant now in course of completion by Yount, Reid and Thistlewaite will work the ores of the South Fork district successfully. A test was made recently in a small way with a small furnace. Twenty pounds of ore each from the Crystal, Dayton and Big Central was tested in a small furnace, and by their process, and the ore worked to perfection and entirely satisfactory to all concerned. Mr. Thistlewaite has charge of the Crystal and proposes to work 100 tons as soon as the plant is finished. The ore from this mine will average 104 ounces to the ton. The Dayton ore was the most rebellious, yet it was worked successfully.

RICH SULPHURETS SHIPPED.—The Reid Mines Consolidated Company of Old Diggings has shipped a carload of rich sulphurets to the Portland Smelting and Refining Works, Linnton, Oregon. The directors had a meeting in San Francisco on Saturday last, and by reason of the wonderful developments in the mine, determined to advance the price of the treasury stock to $2.50 per share. The product of a week's run at the Hart mine in Old Diggings was 101¼ ounces, or something like $2700, or $12,000 per month. A heavy San Francisco company is working on a bond the Tom Greene mine, near French Gulch. Gould, who was the manager, has gone to seek newer fields of industry. He is said to be very sick.

Sierra.

ALASKA MINE AT PIKA CITY.—Nevada *Transcript*, Dec. 1: A strong company has been formed, with a hundred thousand dollars in bank, to start up the old Alaska mine, Sierra county. Owing to bad management and other causes, this famous mine was closed down about six years ago. It has a splendid record as a gold-producer, and it is the opinion of those who know all about the mine that it can be made, when thoroughly opened, one of the very best mines in the State. Several well-known capitalists, accompanied by two first-class mining men, went to mining Friday to start active work on the property. The late snowstorm has done considerable damage to the buildings and machinery, but all will be placed in good condition without unnecessary delay.

Siskiyou.

QUARTZ.—Yreka *Journal*, Dec. 7: The Siskiyou Mountain quartz mine, about three miles from Hilt's mill, above Henley, and near Cole's, is turning out exceedingly rich. With a two-stamp mill and two men drifting, the Spencer & Co. mine yielded about $8000 in 24 days, the ledge being a fissure vein, in which gold is plainly visible to the naked eye. Hilt and others have claims in the same vicinity, and the prospects are very favorable for that locality becoming one of the richest paying quartz-mining districts on the coast. James Ironsides made a cleanup last week from his Cherry Creek ledge, and sent the sulphurets below to Selby & Co., the returns from 100 tons, including sulphurets, averaging over $61 to the ton. He has uncovered the ledge for a distance of 1200 feet, and intends putting up a small quartz-mill in the spring at the head of Greenhorn, with two concentrators attached for saving the sulphurets. The sulphurets are very rich, and Selby & Co. work them so as to save at least 95 per cent of the gold. All the quartz ledges on Greenhorn, Cherry Creek, Deadwood and throughout the Humbug range, on west side of Yreka, will pay big if the sulphurets are scientifically treated, in saving the gold, as the flour gold is generally carried off in the fine sand which the quicksilver fails to catch. The concentrators save the sulphurets and fine gold by means of corrugated belting leading around wheels to a tub. In mills having no concentrators, the sulphurets and fine gold float off with the water from the batteries, and a similar result is experienced in placer mining also.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Enterprise*, Dec. 4: 1100 level—The west crosscut from the main north lateral drift, 315 feet north from the shaft station, has been advanced 32 feet; total length, 466 feet; face in porphyry and low-grade quartz which gives assays of $2 to $3 a ton. 1500 level—From the south drift at point of connection with the old stopes, we continue to extract some ore and fillings of average milling value. 1600 level—We have continued prospecting upward from the old sill floor of the old stopes, from which some ore of fair quality is being extracted. 1650 level—Continue to extract some ore from the drift run east from winze No. 3, down 73 feet, in working upward from that point. Also some ore from the old stopes at the north end of the California ground. From the crosscut run west from the northwest drift we are running north in the old stopes and extracting some ore. 1750 level—Have continued to extract some milling ore from the point where the upraise from the end of the drift run south from the end of the crosscut run west from the end of the main southwest drift connects with the 9th floor openings. Are extracting ore along the drift which connected this upraise (45 feet up) with the upraise 44 feet east. Have continued stoping out ore along the drift run north from the crosscut run west from the main southwest drift. From the main southwest drift, 82 feet north from the east crosscut No. 5, an old west crosscut has been reopened a distance of 63 feet, and a north drift has been advanced 34 feet in a porphyry and quartz formation which gives a low assay value. 1800 level—In stoping upward from the drift run south from the crosscut run east from the bottom of winze No. 2, down 45 feet, have extracted some milling ore. There has been extracted from all parts of the mine during the week 959 580-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $24.79 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $20.33 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $16,835.40.

OPHIR.—1465 level—The upraise started on the sill floor, on the north side of the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 feet below the sill floor of this level, has been carried up 8 feet; total length, 22 feet, the top being in porphyry and quartz. Have shipped to the Mexican mill 407 970-2000 tons of ore, the average assay value of which, per car samples, was $22.87 per ton. The average assay value of all the ore worked at that mill, per battery samples, was $18.60 per ton.

MEXICAN.—On the 1465 level the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 25 feet; total length, 351 feet; continuing in a porphyry formation with lines of low-grade quartz.

HALE & NORCROSS.—We continue retimbering main shaft at the 800 level. Main incline—Are making the necessary repairs. 1300—Are repairing the north drift. 1800—Advanced No. 1 west crosscut 18 feet; total length, 192 feet; face in porphyry. West crosscut No. 3 was advanced 20 feet; total length, 140 feet; face in hard porphyry, Advanced main north drift 19 feet; total length, 294 feet; face in porphyry. During the coming week a west crosscut (No. 4) will be started from the main north drift on this level, near the north line of the mine. The west drift on the 150 level of the old or A-street workings was extended 28 feet, making its total length 112 feet; face in porphyry, with some streaks of quartz.

ANNEX.—On the 420 level the north drift from east crosscut No. 1, north, was advanced 15 feet; total length, 78 feet; formation, porphyry and clay.

BEST & BELCHER.—200 level—On this level the northwest drift has been advanced 22 feet during the week; total length, 42 feet; face in porphyry. All work on the 900 level during the week has been on repairs.

GOULD & CURRY.—200 level — West crosscut No. 5 has been advanced 21 feet during the past week; total length, 142 feet; face in porphyry, clay and stringers of quartz. West crosscut No. 6 has been extended 8 feet through soft porphyry; total length, 20 feet. On the Sutro tunnel level, the joint north drift with Savage Co. has been advanced 12 feet; total length, 71 feet; face in very hard porphyry.

ARIZONA.

ARIZONA TOMBSTONE.—*Epitaph*, Nov. 30: Much activity in mining circles, even at the present low price of silver, is being felt in and around Tombstone. The end of the year is fast approaching, and assessment work is now the order of the day. Many chloriders who have leases on different properties, and who own mines elsewhere in the district, are doing assessment work on them, while many other properties which have been idle for the past year are developed to the extent of $100, and it is expected that between now and New Year, few, if not many, strikes will be made. Some of the mines being worked by chloriders, all of whom are making good wages, are looking well, while others are doing considerable development work.

T. M. & M. Co., which ranks first as silver-producer in the territory, speaks highly of the management of the present superintendent, W. F. Staunton. It is needless to go into details of the extensive development of this mammoth property, as its shipments of from 800 to 1000 tons per month speak for themselves. In addition, the expansion joints for the new pump have arrived, and having been placed in proper condition, exceeds all expectations. The depth is now 130 feet below water level, and the intention is, with the present capacity of this pump, the shaft will be sunk about 200 to 250 feet lower and operations will commence on the 1st, and undoubtedly a new force of men will be required.

THE JONIETTA, which has been under lease to Perasich, Farrington and Scribner up to the 20th, has been renewed and a fresh start on this silver-producer will be made on the 1st. This property looks well, and the present indications are looked upon very favorably by the lessees.

STATE OF MAINE is under lease to six different parties, who are working in ore, and another shipment is expected to be made by the 1st.

BROTHER JONATHAN, being worked by Heli and Mitchell, is looking favorable. Considerable work is being done on this mine, and a shipment from this promising property will soon be made.

XXX MINE, under lease to Frary and Cronchley, is one of the State of Maine group, and the lessees are satisfied with the outlook. Regular shipments from this mine are being made, and another will be added to the list shortly.

BONANZA.—This property is being worked by George Bravin and Harris Bros. A shipment was made recently, and at present, development work is being rapidly pushed.

CHANCE, belonging to the Grand Central Co., is under the able management of Leach and Jones, and a shipment is now on the road to the smelter. Judging from the amount of ore in sight, and the active development of this bonanza, the force of men will be enlarged to push work more rapidly and increase shipments to a regular routine.

UNCLE SAM, worked by George and Houghton, is looking encouraging. Work is being concentrated in sinking main shaft to lower level, and drifting will be begun as soon as completed.

RANDOLPH.—McPherson's 16-mule ore teams are busily engaged hauling a shipment of rich ore from this property. Warner and Bell are the lucky owners.

ALASKA.

COOK'S INLET COAL.—Cor. Juneau *Mining Record*, Nov. 10: I have located a coal claim, and have also located an agricultural claim. They are not far apart. The coal claim has three separate veins that show plainly; two veins are about six feet each in thickness, the other somewhat smaller. The coal is good, cannot be beaten for domestic purposes. I am confident that in the near future these mines will supply a large demand on this coast; there is an unlimited quantity that is far superior to any coal that I have ever seen on this coast. If the location was where it could be seen by capitalists, I do not think that there would be any doubt of their investing. The country is new and there is not much doing at present. There are miles and miles of fine grass in sections of this country. I think it is a kind of blue joint and grows three to five feet high. I have every confidence in the country; the coal mines of themselves are sure to develop it early, outside of grazing lands.

BRITISH COLUMBIA.

VANCOUVER HYDRAULIC COMPANY.—Kamloops *Sentinel*, Nov. 30: This company having got their works in readiness at Van Winkle bar, as reported last week, let water onto their gravel, but owing to the severe weather which began last Friday, they were compelled to stop operations. The company has only available about 700 ont of the 1200 to 1500 miners' inchee of water to which they have secured the rigbt, but even with tbis diminished qnantity, the engineering and mecbanical arrangements were found to be most eatisfactory, and to give assurance to those who have embarked their capital in tbe enterprise, tbat their money has been expended jndiciously and with excellent judgment. It is not yet decided whether operations will be resumed again tbis season, as that will depend on tbe weather. Should it continue inclement, it ie probable that the company will decide to snspend further operations nntil the spring, and make a clean-up now of tbe week's work. When in full operation the hydraulic appliances are sufficient to wasb from 3500 to 5000 cnbic yards (according to tbe circumstances) of gravel in the 24 hours. The company have abont 800 acres of gronnd, the gravel heing on three benches, and tbe depth of them varies between 120 and 400 feet.

COLORADO.

NOTES.—A Denver dispatch of Dec. 5th says: The great Gowan Haven tnnnel at Aspen has broken all of its previons records, for during the month of November it was extended 379 feet. The face of the tunnel is now over one and a half miles from the entrance. The greatest distance driven during any previous month was 312½ feet. The Aspen Mining and Smelting Company shipped during November 3858 tons. During the year the mine has shipped 37,400 tons of ore and has done 11,600 feet of development work, amonnting to over two miles. The Aspen mine shipped 3600 tons last month. There are 245 men on the pay roll. The Champion mine at Lake City has just been sold to Benner & Hessler of Abilene, Kan., for $100,000, of wbich $22,000 was cash. There has been considerable activity in the Cripple Creek district the past week, and arrangements have heen made for the location of a large nnmber of new stamp-mills. A nnmber of contracts have been let, and it is easy to estimate that at least 1000 stamps will he working before April 1st. New strikes are still being made daily and everything looks encouraging for this camp to to make the finest producer the west has ever known. Dnring the week small sales aggregating over $100,000 were reported. An average of five carloads of ore per day ie being shipped to smelters from this camp. The stamp-mill located here treats about the same amount, making a total daily outpnt of ten cars, or 150 tone.

NEW MEXICO.

TURQUOISE MINE.—Silver City *Enterprise*, Dec. 3: The mine owned and worked by Armeny & Co., near Paschal, is making its regular shipments of fine turquoise, and from all appearances must be returning a good profit to the owners, as it has been kept in constant operation for more than a year, and it ie not probable that it would be worked continnously and regnlar shipments made if it were not paying. This company is a close corporation, and gives no figures for pnblication; but from every evidence of success apparent at this mine, and from equally good indications at other mines in the county, it may be safely predicted that turqnoise mining will ere long be a prominent indnstry in Grant connty.

MOGOLLONS.—The Mand S mine and mill are running full blast. The bnllion shipments are being regularly made hy the company. The Last Chance lessees are taking out good ore from the mine, and bullion shipmente from the mill will soon be the order of the day. The strike in the Eberle proves beyond donht that tbe great veins known as the Queen and Great Western have large extensive ore bodies at intervals for miles along their length. The immense ore bodies in sight in the Consolidated mine npon the Queen lode are not being utilized for lack of milling facilities. While one-third of the value of the ores of thie camp is gold, and while it is probable that the gold alone would pay a profit over and above the cost of mining and milling, yet the owners of the valuable properties are reluctant to place their ores or bullion prodnced upon the market in the present and unetable state of the silver market. No one cares to take new ventures in hnilding mills or increasing the capacity of those tbey now have nntil some positive settlement of the silver question is arrived at. Let this matter be placed npon some positively permanent basis, and the Mogollons will boom.

OREGON.

CABLE COVE DISTRICT.—Bedrock *Democrat*, Nov. 30: J. C. Young is in from the Grey Eagle and reports mining affairs eteady in that section. Development work is being pushed ahead and on many properties will continne all winter. A large amonnt of good ore is being extracted and the veins improve as work progresses. Mr. Young, like all who are acqnainted with the Cable Cove district, has nnflinching faith in the camp and says that time is all that is required to prove the merits of the numerous propertiee of that section.

A MINING CONTEST.—One of the most interesting law suits tbat will come before the next term of the Circnit Court is the White Swan mining case. The ownership of thie valuable property ie claimed by Ed. Borman, who avers that the ground is covered in his St. John location, an adjoining property that was discovered several years since. Messrs. W. H. Mulkey, S. B. Baisley and G. S. Tarbell claim to be the rightful owners to the White Swan quartz claim, hy virtue of discovery and the fulfillment of the requirements of the mining laws. This property came into promiuence about one year ago, when these gentlemen opened np the property, exposing a rich vein of free-gold ore and taking ont thousands of dollars of the yellow metal in a short time. Abont two months since Messrs. Mulkey, Baisley and Tarbell mane applications in the U. S. land office at La Grande for a patent to the mine and an adverse claim has been presented by Mr. Borman.

MONTANA.

SOUTHRAN CROSE AFFAIRS.—Butte *Miner*, Dec. 1: Salton Cameron, the mine and mill man of the Georgetown district, was in the city a few days ago for the purpose, it is said, of completing arrangements for starting up his mill on Southern Cross ore. The Southern Cross Company is figuring on treating its product by the cyanide process, and is negotiating with Mr. Cameron for the use of his mill therefor. The ore, of couree, will first be crushed by the ordinary etamp method and then be snbjected to cyanide treatment, tanke for which either bave been or will be placed in the mill. It has also been hinted that a change in the personnel of the corporation, so far as the president, secretary and manager are concerned, will be made, the directors, so the report saye, believing that the interests of the stockbolders will be best subserved thereby. The district in whicb the Southern Cross is located is a good one, and there are many who believe that with proper management the property can be tranefermed from a name into a gold-producer of merit.

RADUCAN SHIPMANTE.—That the emelters at Anaconda are not receiving as much ore from the company's mines in Bntte ae they were eight or ten days ago is evidenced hy the fact that on last Monday the daily shipments were reduced from 105 to 90 carloads, which makes a shipment of abont 375 tons. A few months ago the company was shipping from 150 to 160 cars per day, bnt a decision to curtail the production of copper cansed a falling off of nearly 30 per cent. The 375 tons is about the daily prodnction of the Monntain Consolidated mine, which was closed down about 11 days ago to permit of repairs to the shaft.

DIVIDENNS FOR TEN MONTHE.—Miniug companies of the State have paid dividends from January 1st to October 31et as follows: Bald Butte, $20,000; Bannister (Butte), $6000; Elkborn, $275,000; Granite Mountain, $500,000; Hecla, $150,000; Helena and Frisco, $20,000; Iron Mountain, $135,000; Pandora (Soap gulch), $3000; Parrot (Butte), $180,000. Total, $1,289,000.

RICH STRIKE IN THA DESPATCH.—Among the rich strikes made during the week was one in the Deepatch mine, adjoining the Star West on the south. The property ie owned by George W. Farlin and is located in the rich gold-silver district of the camp. The body of ore encountered is said to be quite extensive.

OREGON.

AT ELKHORN MOUNTAIN.—Cor. Bedrock *Democrat*, Nov. 30: The Baisley-Elkhorn mill and mine are running at full capacity, and to judge from the enormons ore-bodies in sight, they are liable to run for two or three years. If large bodies of ore and a well-eqnipped mine mean a paying property, the Baisley mine is one of the best payiug properties in Oregon. It is a etrange matter that Portland capital does not look at the mineral resonrces of eastern Oregon and devise some ways and meane of treating ores in Oregon. Capital can and should erect rednction works right here in Baker conuty to treat the ores of this conuty alone, and we are snre they would be eurprised at the income derived from euch an adventure. The Robbins mine is working a small force. They have completed the connection from the lower to the upper tnnnel, and now have good air throughout the mine. No doubt she will etart np ere long. The Hnrdy Gurdy mine and mill have closed down for the winter, owing to the fact that they commenced operations too late in the season to secure their winter's enpply of wood.

UTAH.

ONTARIO.—Park *Record*, Dec. 3: It will be remembered that R. C. Chambers went east last week and the *Record* eaid it was presumed hie mission was to pick up any etray sharee of etock that might be floating about the eastern market. Onr informant says that his missiou is of a different nature altogether—that it is to hold a general consultation looking to a large increase in the output of the Ontario mine. This means that not only will the quantity of shipping ore now being mined be increased, but also an addition to the company's present milling capacity. Our informant says he knows positively that such an increase has been nnder contemplation for some time and that Mr. Chambers has been snmmoned for consultation to that end. This means a great deal for the fntnre of Park City ehonld the company decide to make a large increase in its present facilities, and shonld the monetary conference result in the recognition of silver as a money metal, the benefits will be something that cannot be fully realized.

CAMP CROSSCURE.—The Crescent will drive its big drain tunnel and work will be commenced as soon as the preliminary arrangements are perfected. Drifting on the vein has commenced at the Cumberland and the property is looking fine. The indications for pay ore grow brighter and brighter. Ore hauling ie quite lively considering the conditions of the roads, and the big mines are sending down heavy shipments. Mattere are reported as growing worse in the Ontario drain tunnel. The volnme of water is eteadily increasing and the eand and loose rock is much more troublesome. The Glencoe is pushing developments eteadily and quietly. The Daly West is still sinking, the shaft being over 1200 feet in depth. A drift is being run from the 800 level of the old Daly to furnish better air and a perfect drain and connection betweeu the two properties will eoon be established. Operations were commenced on the Meears group Wednesday morning and the property is being placed in sbape to begin active sinking and drifting. Some ore is being hoisted that was broken down before work was discontinued last snmmer. It is hoped that no more interruptions will occur and tbat the Meears will eoon develop into a shipping property.

SOUTH DAKOTA.

NOTES.—Deadwood *Pioneer*, Nov. 30: The Black Hills Mining Company, whose plant ie located at Rapid City, has put in a ten-ton Brackner roaster—tbe largest in the Hills—and bas another one on the ground ready to put in. Specnlating in mining stocks is almost a thing of the past. Tbose who own stocks prefer to bold them, and those who do not own stocks buy claims for development. Ruby Bell eold at 22c, Uncle Sam at 1c, Carthage 1c. Harris Franklin has a lot of ores, consisting of 30 tons, taken from the Golden Reward, Double Standard and other mines, which he will take to Pittsburg, Kan., for a test run by the "Chick Rapid Extraction" process. The Buxton Company is making regular shipments of eix carloads of ore per week from the Buxton property to Aurora, Ill., notwithstanding the fact tbat the opinion was expressed over a year ago that the mine was worked out. Superintendent Hunter of the Hawkeye mine is looking daily for the arrival of the machinery for his 40-stamp mill. He has a force of men at work on the tram and will add to the number of men at once. Mr. Hunter hopes to begin milling by January 1. The J. R. Mining Company has its engine and boiler in position and is at present sawing lumber for use on the mill and mine. The stamps will begin dropping again in a few days, and mine and mill will run all winter. Five stamps have been added to the batteries. The shaft of the Cliuton Company passed throngh an ore zone five feet thick at a depth of 145 feet. After passing the zone, drifting to the east commenced, and it is confidently expected that the ore body will be encountered within a distance of 50 feet from the bottom of tbe shaft. Messrs. Waite and Ankeny are erecting a first class steam hoist over the two-compartment shaft of the Florence, which will be completed in about a week. The fact that the mines of this company were prospected with a diamond drill before the commencement of these expensive works and improvements, leads one to infer that the result of the prospecting was satisfactory.

WASHINGTON.

SLOCAN.—Spokane *Chronicle*, Dec. 2: Another big mining deal was closed yesterday, iu wbich three of the rich Slocan properties were sold to Spokane parties. It was what is known as the Alamo group, consisting of the Alamo, Twin Lakes and Ivy Leaf claims. They were sold by Albert Behne, James Gillhooley and Andrew J. Murphy to H. D. Scribner and J. L. Drumheller for $40,000. The sale might be called a conditional one, or perhaps more properly a bond. The pnrchasers will begin working three ehifts of men in developing the properties. The location is nesr the Idaho line. This ie the largest price paid for Slocan claims, with one exception. Mr. Patsy Clark paid $75,000 for a group of four claims.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 15.		WEEK ENDING Nov. 22.		WEEK ENDING Nov. 30.		WEEK ENDING Dec. 7.	
Alpha	.25	.30	.25	.30	.25	....	.25	....
Alta	.20	.25	.25	.30	.25	....	.30	....
Andes	.45	.55	.45	.55	.45	....	.45	....
Belcher	1.50	2.25	1.60	2.50	1.60	1.85	1.65	2.00
Belle Isle	.05	....	.05	....	....	....	....	....
Best & Belcher	1.40	1.85	1.45	1.85	1.40	1.60	1.40	1.60
Bullion	.35	.80	.50	*.85	.60	.90	.70	.85
Bodie Con	.20	.25	.15	.25	....	....	.25	.30
Bulwer	....	....	.20	....	....	....	.20	....
Commonwealth	....	....	....	....	....	....	....	....
Con. Va. & Cal	2.80	3.15	2.55	3.25	2.60	2.90	2.50	2.75
Challenge	.50	.70	.55	.75	.55	.70	.45	.60
Chollar	.70	1.20	.75	1.35	.70	.95	.80	.95
Confidence	1.50	1.90	1.80	2.00	1.95	2.00	2.25	2.75
Con. Imperial	.05	....	....	....	....	....	....	....
Caledonia	.20	....	.20	.25	....	....	.20	.30
Crown Point	1.00	1.35	1.00	1.85	.95	1.10	.95	1.15
Crocker	....	....	....	....	....	....	.05	....
Del Monte	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.10	.20	.15	.20	.10	.25	.20	.30
Grand Prize	.05	....	....	....	....	....	....	....
Gould & Curry	.85	1.10	.85	1.25	.70	.85	.75	.90
Hale & Norcross	1.30	1.45	1.45	2.10	1.35	1.70	1.55	1.90
Julia	.10	....	.10	....	....	....	.05	....
Justice	.05	*.30	.20	.30	.25	....	.30	.50
Kentuck	.20	.25	.20	....	.15	....	.20	.30
Lady Wash	.10	....	.10	....	.10	....	.15	....
Mono	.25	.30	.25	....	.15	....	.25	....
Mexican	1.25	*1.80	1.60	1.90	1.50	1.65	1.45	1.55
Navajo	.05	....	....	....	....	....	....	....
North Belle Isle	....	....	.05	....	....	....	....	....
Nev. Queen	....	....	.5	....	....	....	....	....
Occidental	.10	.15	.10	.15	*.30	.35	.40	.45
Ophir	2.60	2.90	2.55	3.20	2.55	2.30	2.40	2.70
Overman	.60	.90	.60	.90	.60	.70	.60	.70
Potosi	.95	2.25	1.40	2.45	1.25	2.10	1.75	2.10
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	....	....
Savage	1.15	1.65	1.25	1.80	1.20	1.30	1.25	1.35
S. B. & M	.25	.50	.30	.50	.25	.30	.30	.35
Sierra Nevada	1.05	1.40	1.15	1.60	1.15	1.25	1.00	1.30
Silver Hill	.05	.10	.10	....	.10	....	.15	....
Scorpion	....	....	.10	....	.10	....	.10	....
Union Con	1.05	1.40	1.15	1.55	1.15	1.25	1.10	1.25
Utah	.15	....	.10	.20	.10	....	.10	.15
Yellow Jacket	.50	1.15	.85	1.15	.80	.90	.70	.90

*Assessment added.

Eastern Metal Markets.

NEW YORK, Dec. 8.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	39 3-16	85¼	12 00	3 65	20 07½
Friday	39⅜	85¼	12 00	3 55	20 00
Saturday	39	85	12 00	3 65	20 00
Monday	38⅞	84¾	12 00	3 65	19 20
Tuesday	38⅝	84	12 20	3 75	19 65
Wednesday	38½	83½	12 20	3 75	19 45

Pig iron is weak at the recent decline. Quicksilver is steady. Copper is very strong, with holders firm in their advanced views. Pig tin is weak in sympathy with silver. Pig lead is barely steady.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEAK ENDING NOV. 29, 1892.

487,206.—FAUCET AND BUSHING—M. Anthony, Berkeley, Cal.

487,207.—FAUCET AND BUSHING—M. Anthony, Berkeley, Cal.

487,112.—NECK YOKE—J. S. Brown, Eureka, Cal.

486,859.—WATER FILTER—Joseph Davis, San Francisco.

486,860.—WATAA FILTER—Joseph Davis, San Francisco.

487,118.—REVERSIBLA WINDOW—Jas. Farqnharson, Tacoma, Wash.

487,217.—ROTARY ENGINA—Gsmbetta & Harsin, Stockton, Cal.

486,981.—SHOW WINDOW STANN—C. H. Grueuhagen, San Francisco.

487,051.—DIAPHAAOM FOR GAE METARS—A. Henning, Los Angeles, Cal.

487,221.—ROTAAY MOTOR—Robt. Hewson, San Francisco.

486,932.—TIRE SETTAA AND COOLER—A. J. Ianson, Waverly, Wash.

487,123.—BIT BRACA—A. Knudsen, Tucson, A. T.

487,199.—REFAIOAAATOR—A. McDowell, Selma, Cal.

486,897.—HYDAAULIC MINING APPARATUE—A. M. Rawson, San Francisco.

487,201.—VEHICLE SPRING—H. Timkeu, San Diego, Cal.

487,202.—VEHICLA SPRING—H. Timken, San Diego, Cal.

487,138.—COMBINATION LOCK—E. Vanwart, Port Madison, Wash.

The following brief list by telegraph, for Dec. 6, will appear more complete on receipt of mail advices:

California—Robert Beyrle, Los Angeles, filtering system; Thaddeus B. Rower, San Francisco, car coupling; Henry E. Dikeman, Berkeley, track brake; Andrew Frazier, San Francisco, ore concentrating machine; David Evans, Eureka, logging railway; Alfred Gonzales, San Francisco, ore concentrator; Frank A. Huntington, San Francisco, ore car; Frederick S. More, Hanford, plow; Joseph Rodes, San Diego, camera tripod; Mark P. Schetzel, San Francisco, covering for buildings; William. H. Scott, San Francisco, bed bottom; Edward T. Steen, San Francisco, pipe coupling; Melvin A. Taylor, Oakland, routing machine; George Weeks, Oakland, rail joint. Washington—Stephen Chaplin, Buckley, valve gear; Arthur M. Leighton, Port Townsend, last; Robert Moran, Seattle, coin-actuated vending machine. Oregon—Robert D. Hume, Gold Beach, can-lacquering machine; Clarence J. Simeral, Maccay, gate.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRASS U. S. and Foreign Patent Agency, the following are worthy of special mention:

COMPOUNN ROTARY ENGINE—John Gambetta and Chas. D. Harsin, Stockton. No. 487,217. Dated Nov. 29, 1892. In this patent the inventors have shown two pairs of cylinders fixed at equal distances apart around the interior of a rim or casing which rotates npon a central axis. The outer ends of these cylinders are closed and the inner ende open. The pistone of these cylinders are connected by suitable pitmen with a stationary crankpin, which ie eccentric to the center about which the rim and cylinders revolve, and it will be manifest that as the rim and cylinders revolve about this crankpin the pistons will be alternately reciprocated within their cylinders; and when steam or other pressnre is applied behind these pistons, they will act upon this etationary crankpin to rotate the cylinders and rim. In the present invention, each pair of opposiog cylinders is compounded; that is, one of the cylinders receives steam directly at high pressure, and, when it has acted so as to carry the rim and cylinder one-half a revolntion, the steam is exhausted through suitable passages into the opposing cylinder, which is of larger diameter, and within which the steam acts npon its piston expansively.

RAFRIOERATOR.—Albert McDowell, Selma, aseignor of one-half to John A. Stroud. No. 487,199. Dated Nov. 29, 1892. The invention relates to the class of coolers designed to contain water or perishable articles. It consists in the novel construction of the outer casing and inner chamber of the cooler with encircling air-passages and satnrated absorbent coverings, and the novel construction and arrangement of the feeding device by which water is automatically snpplied by the absorbent coverings.

ROTARY MOTOR.—Robert Hewson, S. F. No. 487,221. Dsted Nov. 29, 1891. This invention relates to the employment of steam under pressnre npon a wheel so as to take advantage of its reactionary force. The wheel has peculiarly formed buckets or vanes fixed around its periphery and in a double row, one set of bnckets acting oppositely to the other, so that the movement of the wheel may be reversed. The wheel is monnted upon a shaft and rotates in close contact with a surface throngh which openings are made from the eteam chest to deliver steam under high pressure into the bnckets of the wheel and canse it to rotate in either direction, as desired. Independent valves control each of the parts, and the power of this wheel may thns be increased or diminished to snit conditione. Within the exhaust chamber is a heating coil for the boiler feed-water.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Dec. 8, 1892.

With clear skies and improving roads, general trade is now active, particularly for holiday goods. The trade continues to buy in a small way, preferring to purchase oftener than to carry large lines of goods. This spirit of conservatism has placed merchants, as a rule, on this coast upon a solid footing, from which they should not be allured even during the prospective active times in 1893. With iron-workers and manufacturers in general, business is only moderately fair. The Monetary Conference and the uncertainty regarding silver are important factors for the movement, and until the future is more clearly defined, it looks as if no improvement can be expected. If the Conference should act favorable toward the white metal, it is contended that general activity in trade circles and manufactures can reasonably be looked for. At this writing, press dispatches throw a dark cloud around the proceedings of the Conference, from which deductions are drawn that it will prove a failure. While this may possibly prove to be true, yet the writer fails to see any such signs as to warrant such conclusions, but, on the contrary, much to justify that a compromise will finally result. This opinion is largely founded on the well-known fact that when the extremes meet each makes a proposition, and, after contending for points, an agreement is usually arrived at. In this instance, it now looks as if this course will follow regarding the silver problem. England, as a monometallist or gold country, through its delegates, has made concessions to bimetallists in the form of an agreement by which the market value of the white metal will not go below $1 an ounce. This, from her point of view, is quite a concession. The United States, through her delegates, contends for free coinage by all countries of both gold and silver—the latter at the ratio of 16 to 1. While it does not look as if this ratio will be secured, unless this country and the silver-using nations make concessions in duties on certain foreign goods, yet a higher ratio may possibly be agreed on. The committee, to which was referred the various plans, is hard at work, and, so far as we are advised, have not formulated any plan. While the committee is in session the delegates at each general or public meeting of the Conference discuss the money question in its various bearings. It is by discussion that persons are enlightened and bimetallism seeks such means of proselyting. Judging from press telegrams, strong pressure is being brought to bear by several industries in Europe on monometallists in favor of silver.

The local money market, for the season of the year, is fairly easy, when it is considered that the uncertainty regarding silver is a prime factor in creating a spirit of caution on the part of outside capitalists and banks. Fears that the monetary conference will prove a failure cause banks to prepare for the worst, so as to meet any financial panic which may be precipitated by a fall in the market value of silver. So far as we are able to learn, there is less commercial paper on the market in this month than at the corresponding time for years. Arguing from this we should say that the merchants, manufacturers and others in business are situated better, financially, than for years. There is a fair demand for exchange on New York and London, and under light offerings rates hold strong.

Eastern mail advices report general activity, for the season of the year, in all branches of trade, with the south and southwestern States purchasing freely. The advance in the market price of cotton has contributed no little to this improvement. It is stated that in several branches manufacturers have not only sold well up but have large orders ahead. This activity finds proof in the gradual advance of the wages of factory hands. The money markets at the East continue to be reported as working easy. A leading authority says that there is a scarcity of commercial paper, although more was on the market owing to fears of gold shipments. With gold shipments resumed, it was contended, it would create more or less of an artificial stringency.

SILVER—The market held fairly firm up to Tuesday, when it broke off about two cents under strong bear selling at the East and abroad, owing to public and private advices to the effect that the Monetary Conference would prove to be a failure. These reports were widely circulated and generally believed, in the face of the committee, to which all proposals were submitted, not having reported or even formulated a plan. That these reports were put out for speculative purposes does not admit of a doubt, and that they were a success, so far as depreciating nearly all commodities and securities are concerned, is equally as certain. It now looks as if silver will be a good gamble, for, while the conference is in session, there ought to be lively turns in the market. A bill has been introduced in the lower house of Congress and another in the Senate repealing the present law authorizing the purchase of 4,500,000 ounces of silver bullion a month. From all present indications, it looks as if nothing will be done by Congress legislating on silver until the Monetary Conference acts, when a bill will be passed in conformity to the plans adopted by the conference. Press telegrams quote the New York market at 82¾ cents to-day. There was exported the past week $164,500 in bullion to Bombay and $1160 to China.

MEXICAN DOLLARS—The market is quiet, with prices, since the steamship for China sailed, altogether nominal. Large buyers bid 66 cents. The last steamship for China took out $390,111 to China and $67,780 to Japan.

QUICKSILVER—Receipts the past week were light, aggregating only 159 flasks. The market is quiet at current quotations. The exports by sea aggregate 50 flasks to Mexico.

ANTIMONY—The market is quiet. New York mail advices quote that market for round parcels as follows: 10¾c for Hallet's; 10¾c@11c for LX; 11c@11¼c for Crown; and 11½c for Cookson's in round lots.

BORAX—The receipt of only 373 ctls was reported the past week, while 4254 ctls were exported by sea to New York. The market is fairly steady.

LIME—Receipts the past week aggregate 1136 bbls. The market is slow at from $1.25@1.50 per bbl.

PIG LEAD—There is nothing essentially new to report in our market. The demand is slow at unchanged quotations. New York advices report an improved demand for consumption.

PIG IRON—In our market there is no feature worth reporting. Eastern advices are conflicting. Southern iron companies were offering more freely, with some offering concessions. The markets were more or less affected by the decline.

TIN—Pig is quiet, as is plate. Consumers are not disposed to talk business unless for delivery in the spring and summer months. London cables report some business passing in choice coke for shipment to this city. The New York market for pig appears to be still largely under manipulation. The unsettled price of silver is against pig tin.

COPPER — The market has exhibited more strength, with an advance established. *Iron Age* of Dec. 1 reports the New York market as follows: "While there is still some difference of opinion regarding the transactions in Lake Superior product, facts have come to the surface showing that good-sized contracts were placed during the first half of November, and that the quantity of ingot and wire bars amounted to at least 6,000,000 pounds. Some reports have it that fully 10,000,000 pounds were placed during the month. For the past week nothing is reported outside of commonplace transactions; but the movement of prices has been toward a higher level." London cables, Dec. 1, report as follows: "In copper prices there has been a further advance of 17s 6d, followed by a subsequent slight reaction. Speculative interest has been broader, consumption good, the statistical position improved and comparatively little metal offered."

COAL—Imports the past week aggregate as follows: Tacoma 3900 tons, Comox 4100, Challam Bay 1483, Coos Bay 500, Departure Bay 7202, Swansea 7339, Nanaimo 8599, and Seattle 2000; total, 35,123 tons. Cool weather following the rains has stimulated the demand for household, which caused a slightly better call from dealers. In the market there is no material change to note. There is a feeling that prices ought to go up slightly, but they do not, and, at this writing, they look as if they will not. The lower freights made by the railroad on Rocky Spring (Wyoming) coal allows dealers to handle this coal to a much better advantage. For an all around coal, many contend that it is the best in the market.

Mining Share Market.

SAN FRANCISCO, Dec. 7, 1892.

Mining shares the past week under review were more or less neglected by the trading public. Chippers and turntakers are about all that is left of the outside traders, and to make a respectable showing of business cross-orders are resorted to by insiders. From an outside point of view, the market acts very much as if insiders are holding out inducements to moneyed outsiders to enter the market, but as "the burnt child dreads the fire," so do victims of the share market fear to place themselves again in the power of the rings. That still greater efforts will be made to get buyers for shares is an open secret, but it is not at all likely that the inside will get them to hold long enough to pay assessments, for it looks very much as if it is for this purpose that any up-move will be made. On the Belcher move a large quantity of shares is said to have been sold, but when prices went off, buyers began to sell back, and the result is that insiders got the shares back again; and now these same shares must be sold again so as to collect, if possible, assessments which must follow those now levied. The ore development in Belcher sent the shares in that mine up to $6.50 per share, and as other mines in the Gold Hill group are running west to strike that lode, it is not at all unlikely but another boom-let will be successfully made. This time it is said, by persons who ought to know, that insiders will try and get those who buy to hold longer. Of course, the paper now engaged in running the mines down will tell more about ore developments than the mine-owners themselves know. It is a great game, this, working the Comstock mines. It is not denied by miners that there is a lode to the west, but it is narrow. Still, in any other district but the Comstock, the ore extracted would pay handsomely; but wood, water, transportation, miners' wages and indeed everything else cost high, which, with prospecting and dead work to get the mines into better shape, eat up the bullion produced. Every intelligent miner knows this to be the case. The Comstock mines are, without doubt, the most expensive mines to work that there are on this coast. It was thought that large quantities of bullion, outside of what is said to have been proven to have gone astray in the Hale & Norcross suit, were misplaced and that several mines would be paying dividends if the laws under which the companies incorporated were conformed to, but this supposition, so far, has proven wrong. Although several mine superintendents give car-sample assays, as well as pulp assays, yet the companies run in debt, while only two manage to save a little money. The writer fought the rings for over four years to have mine superintendents conform to the law under which the companies incorporated by giving car-sample assays, making full reports of the work, strikes, etc., thinking that this would lead to paying dividends. It now looks that unless larger ore developments are uncovered than are now made public, dividends will be few and far between. Perhaps the companies which are not conforming to the law, giving car-sample assays, etc., have large developments of high-grade ore which, if properly milled, would pay dividends. It stands to reason that honest management invites investigation, and should conform to all laws under which the companies incorporated.

There is a general belief on the street that insiders will not advance the share market until after the holidays, and in the meantime depress prices as much as possible. This is based on the fact that there has not, for years, been a boom before Christmas, and besides, the silver question is against an upmove. There are those, however, who contend that we will have a boomlet before the holidays and none in the forepart of next year. Time alone will tell which side is correct.

News from the Comstock mines is of more work started to the west. It looks very much as if the companies, being hopeless of finding anything big on the main lode, have determined to run for the west lode struck by Belcher. While this work is under way, shares ought to be lively and an attractive gamble for turn-takers. Whether any large development, more than for a milling proposition and for share gambling, will be found, is problematical. The news from the Comstock mines is that in Belcher they have run into four-foot ore, in an upraise, which assays about $45 per ton. When connections are made above, prospecting work will be continued south toward Seg. Belcher. In Crown Point, on the 400-foot level, faster progress in the west crosscut is being made than had been expected, but as the work gets nearer to the west lode slower progress will probably have to be made, owing to the treacherous character of the ground. The west crosscut on the 1300-foot level in Seg. Belcher is being pushed. From Yellow Jacket conflicting reports are received. In Con. Imperial, on the Sage Brush level, a west crosscut is being run. It is some satisfaction to know that prospecting work is being done in this mine. From Confidence and Challenge come the usual stereotyped porphyry and quartz of no value. The work in these two mines is toward the west. In Bullion an important west crosscut is being run on the 1800-foot level. Perhaps this will help to sell the Potosi shares. The work in the latter mines continues to be reported a gamble. News from Choller appears to be kept back. It is rumored, but bow correct we do not know, that very important work is being done in Hale & Norcross. The official letter states that west crosscut No. 4 had been started near the north line on the 1800-foot level. Active prospecting work is being done in Savage, Best & Belcher, Opbir, Mexican and Sierra Nevada. In the Devil's Gate group of mines more activity is reported, with New York shipping ore for reduction. In Silver Hill, in this group, a vein of $7 to $8 gold ore has been struck. In any district in California this would pay handsomely, but on the Comstock it does not and will not until expenses are reduced very considerably.

From the outside mining districts nothing has come to hand beyond the usual weekly routine reports.

The market opened this (Thursday) morning quiet but steady. After Call, Potosi advanced to $2 on a reported improvement in the mine, but it soon fell back, with outsiders selling. Those in position to know, say that the market must go lower, and that there will not be anything until after the holidays. These same persons had the Con. Virginia in 1891, when the shares sold up to $20.87½ in May. The market was depressed and prices sent down in December of 1890, with slightly lower prices after January 1, 1891; but those who held shares made the money. Perhaps we may have an up-move in this month this year, and a boomerang the forepart of 1893.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY TUESDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNAL

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY.
Belle Isle M Co, Nev	5	10c	Nov 6,	Dec 7, Jan 4	J W Pew, 310 Pine
Bullion M Co., Nevada	40	25c	Oct 20,	Nov 24, Dec 14	R R Grayson, 331 Pine
Carra M & M Co			Sept 28,	Nov 28, Dec 28	C C Coleman, 13 Fremont
Challenge Cons M Co, Nevada	13	25c	Nov 30,	Jan 4, Jan 25	C L McCoy, Mills Building
Clifton Con G M Co, California	1	50c	Nov 12,	Dec 16, Jan 7	C E Gunn, Mills Building
Commonwealth Cons M C , Nevada	10	10c	Nov 23,	Dec 28, Jan 24	R R Grayson, 331 Pine
Con Imperial M Co, Nevada	34	3c	Nov 22,	Dec 29, Jan 19	C L McCoy, Mills Building
Cons New York M Co, Nevada	9	10c	Nov 2,	Dec 6, Dec 28	C E Elliott, 309 Montgomery
Del Monte M Co, Nevada	7	10c	Nov 22,	Dec 27, Jan 24	J W Pew, 310 Pine
El Leopoldo G & S M Co, Mexico	1	10c	Nov 11,	Dec 14, Jan 2	Jalez Howes, 130 Sansome
East Best & Belcher M Co, Nevada	3	20c	Nov 23,	Dec 29, Jan 18	C U Mason, 324½ Montgomery
Exchequer M Co, Nevada	34	10c	Oct 28,	Nov 30, Dec 26	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nevada	70	25c	Nov 22,	Dec 28, Jan 20	A K Durbrow, 309 Montgomery
Indian Creek L & M Co, California	3	10c	Nov 4,	Dec 14, Jan 6	S O Mills, Mills B'd'g
Keyes S M Co, Nevada	5	25c	Nov 2,	Dec 6, Dec 27	J H Sayre, 328 Montgomery
Louvre Cons G M Co, California	1	5c	Nov 9,	Dec 14 Dec 30	J F Hotling, 113 Leidesdorff
Navajo M Co, Nevada	23	10c	Nov 5,	Dec 9, Dec 30	J W Pew, 310 Pine
North Belle Isle M Co, Nevada	21	10c	Nov 14,	Dec 20, Jan 17	J W Pew, 310 Pine
North Could & Curry M Co, Nevada	14	10c	Nov 21,	Dec 24, Jan 16	C H Mason, 324½ Montgomery
Occidental Cons M Co, Nevada	11	25c	Oct 25,	Nov 30, Dec 21	A K Durbrow, 309 Montgomery
Russell Reduction & M Co, California	3	10c	Nov 14,	Dec 19, Jan 16	J Morizio, 33 Geary
Sierra Nevada S M Co, Nev	103	25c	Nov 8,	Dec 14, Jan 3	E L Parker, 309 Montgomery
Silver Lick Cons M Co, Nevada	3	2c	Nov 22,	Jan 3, Jan 25	W Ladd, 531 California
South Eureka M Co, Cal	1	2c	Nov 2,	Dec 9, Dec 31	A Halsey, 328 Montgomery
Teresa M Co, Mexico	9	10c	Oct 25,	Nov 29, Dec 16	K J Willats, 807 Market
White Mountains M Co, California	2	1c	Oct 13,	Nov 22, Dec 12	S K Nichols, 320 Sansome

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Andes Silver M Co, Nevada	Annual	J W Twigg, 309 Montgomery	Dec 19
Could & Curry S M Co, Nevada	Annual	A K Durbrow, 309 Montgomery	Dec 19
Head Centre and Tranquility M Co, Arizona	Annual	J W Pew, 310 Pine	Dec 13
Mt Diablo M & M Co, Nevada	Annual	R W Heath, 316 Pine	Dec 16
Ophir M Co, Nevada	Annual	E B Holmes, 309 Montgomery	Dec 27
Trinity River Tunnel M Co, California	Special	E L Griffith, 28 California	Dec 15

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE
Bulwer Cons M Co, California	5	L Osborn, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzel, 310 Pine	Sept 19
Consolidated Virginia M Co., Nevada	50	A W Havens, 309 Montgomery	Aug 17
Eureka Con M Co., Nevada	25	H P Bush, 101 Sansome	Jan 5
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Dec 10
Standard Cons M Co , California	10	J W Pew, 310 Pine	July 26

San Francisco Metal and Coal Market.

ANTIMONY.			**STEEL.**		
Per lb	— @	13	English, lb	— @	18
BORAX.			Canton tool	— @	8½
Refined, in car lots	— @	7½	S'k Diam'd tool	8@	15
Powdered, do	— @	7½	Pick & Hammer	9	10
Concentrat'd, do	— @	6½	Machinery	4 @	5
All grades jobbing at advance.			Tee Calk	— @	4½
COPPER.			**TINPLATE.**		
Bolt	22 @	—	B. V. steel grade		
Sheathing	22 @	—	14x20, sppt	— @	5 87½
Ingot, jobbing	— @	14½	Charcoal, 14x20	— @	5 87½
Do, wholesale	— @	13½	Do roofing, 14x20	— @	6 87½
Fire Box Sheets	22 @	24	Do, do, 20x28	— @	11 75
IRON.			**PIG TIN.**		
Bar, base	— @	3	Spot, lb	— @	23
Norway, base	— @	4½	**COAL.**		
PIG IRON.	Spot.		SPOT FROM YARD—PER TON.		
Eglinton, ton	22 00@	—	Wellington	$8	00
Glengarnock	23 00@	—	Creta	7	50
Am. Soft, No. 1	24 00@	—	Nanaimo	6	50
Oregon Pig	— @	—	Seattle	6	00
Puget Sound	— @	—	Coos Bay	6	00
Clay Lane White	24 00@	—	Cannel	8	50
Langloan	22 00@	—	Egg hard	12	00
Thornoliffe	23 00@	—	Cumberland, in sacks	16	50
Gartsherrie	22 00@	—	Do, bulk	14	00
Brow	22 00@	—	Wallsend	7	25
Cargoffeet	22 00@	—	Scotch Splint	7	60
CHROME IRON ORE.			Brymbo	7	60
Per ton	10 00 @	—	West Hartley	7	50
LEAD.			TO LOAD—PER TON.		
Pig	— @	4½	Australian	6 00@	—
Bar	— @	5½	Liverpool Steam	6 25@	—
Sheet	— @	7	Scotch Splint	6 25@	—
Pipe	— @	6½	Cardiff	6 50@	—
SHOT.			Lehigh Lump	15 00@	—
Drop, sizes *smaller* than			Cumberland	13 00@	—
B, ⅌ bag of 25 lbs	$1	85	Egg, hard	11 00@	—
Do do, B and *larger* sizes			West Hartley	7 00@	—
⅌ bag of 25 lbs	2	10	**COKE.**		
Buck, Balls and Chilled			English, to load	$8 00@	9 00
do, ⅌ bag of 25 lbs	2	10	Do, spot, in bulk	—@	10 00
QUICKSILVER.			Do, in sacks	—@	12 00
Home trade, pr. flask	$41 50	@42 00	Cumberland	9 00@	—
For export	35 50	@38 00			

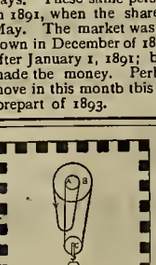
Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Dr.	Cr.		Dr.	Cr.
	Dr.	Cr.	Best & Belcher	—	7,944
ARIZONA MINES.			Bullion	—	*13,001
Crocker	—	1,816	Caledonia	—	2,636
Peer	—	1,126	Challenge	*5,974	—
Peerless	—	2,488	Chollar	—	6,044
Silver King	—	6,007	Confidence	6,923	—
BODIE MINES.			Con. Imperial	*9,058	—
Bodie	—	8,486	Con. New York	*788	—
Bulwer	—	8,330	Con. Cal. & Va	26,016	—
Mono	—	3,770	Crown Point	65	—
Standard	—	40,330	Exchequer	—	*7,426
Sunset	1,871	—	East Sierra Nev	—	7
Syndicate	—	1,243	Gould & Curry	*5,874	—
TUSCARORA MINES.			Hale & Norcross	—	5,748
Belle Isle	*5,057	—	Julia	—	4,288
Coptis	—	3,000	Justice	—	*5,619
Commonwealth	*27,884	—	Kentuck	—	5,298
Del Monte	21,251	—	Lady Washington	—	5,237
Diana	353	—	Mexican	—	*20,406
Grand Prize	—	310	Opbir	430	—
Independence	58	—	Overman	661	—
Navajo	3,920	—	Occidental	—	*12,723
Nevada Queen	479	—	Potosi	22,194	—
North Belle Isle	*8,443	—	Savage	—	13 802
N. Commonwealth	—	795	Scorpion	—	3,619
COMSTOCK MINES.			Seg. Belcher	5,101	—
Alpha	—	5,026	Silver Hill	—	6,987
Alta	—	15,354	Sierra Nevada	*1,055	—
Andes	—	3,978	Utah	1,737	—
Belcher	—	21,659			

*Collecting assessments.

NOTE. Con. Cal. & Va. has bullion valued at $16,946.76, with further shipments to arrive. Navajo has $4300 due on pumping account. North Commonwealth has $1057.28 due on sale of ore.



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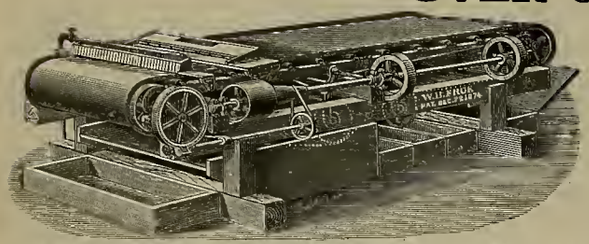

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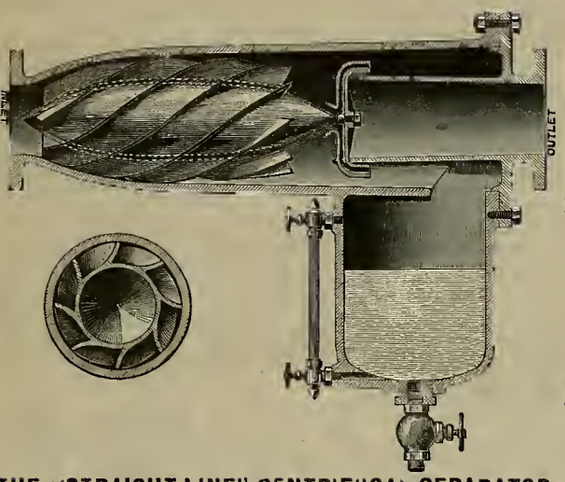

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VOL. LXV. – Number 25.
OEWEY PUBLISHING CO.

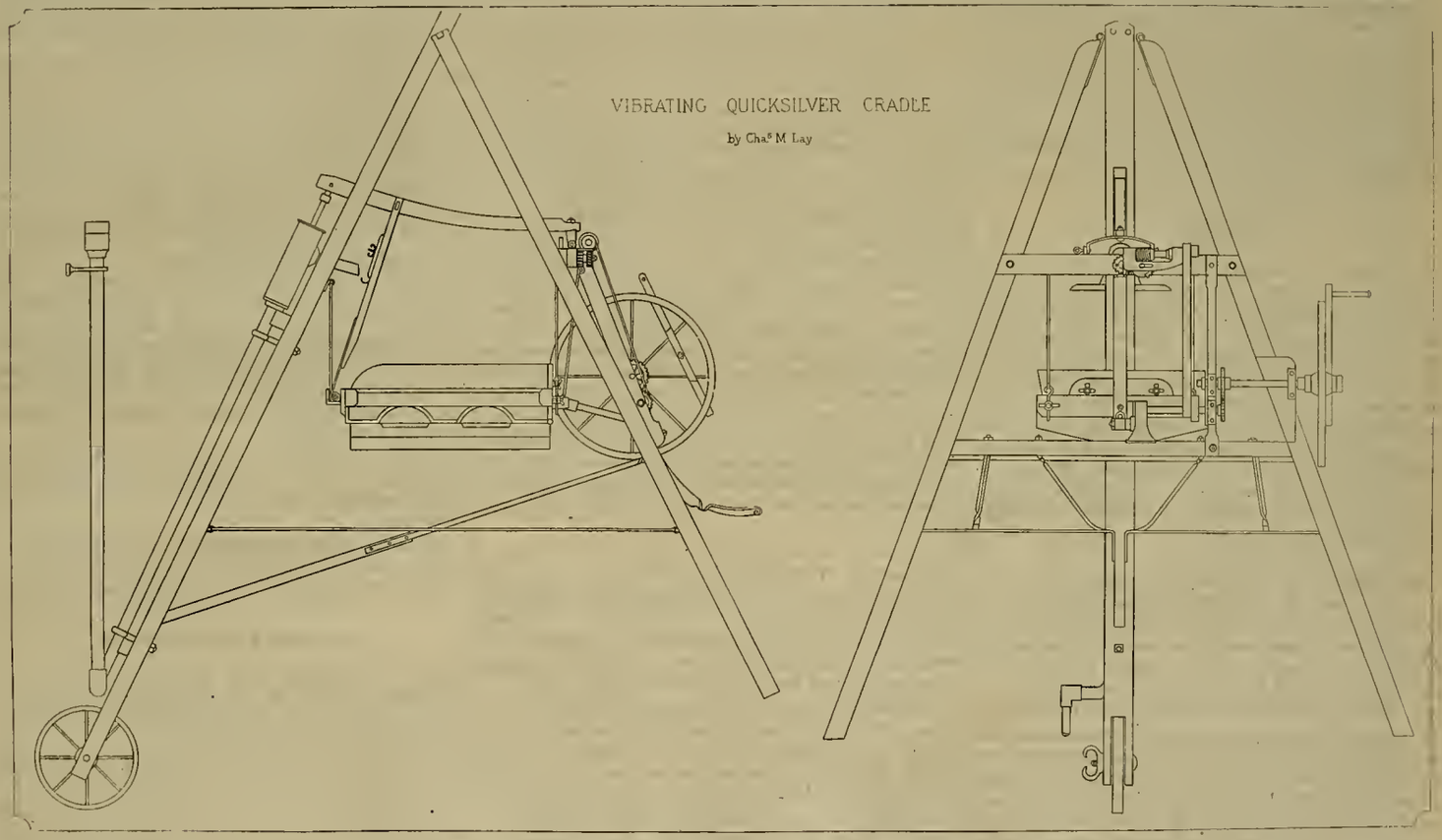
SAN FRANCISCO, SATURDAY, DECEMBER 17, 1892.

Three Dollars per Annum.
SINGLE COPIES, 10 CENTS.

Lay's Vibrating Quicksilver Cradle.

The general arrangement of this machine may he seen by the drawings. The action is as follows: Motion is given to a shaft carrying a flywheel hy hand or otherwise. This ahaft at the other end has a spurwheel working into one of half the diameter on a countershaft, at the other end of which is a crank. This hy means of a connecting rod attached to the cradle, which is hung from the framework at the end of links, hy universal joints, gives it a rocating motion to the extent of the throw of the cam, and hy means of cords attached from the sliding-piece to the front of the cradle, which it alternately shortens and lengthens, tips the cradle from side to side, the reciprocating motion of the cradle continuing all the time.

The smaller particles of dirt which escaped the hopper, or tailings, fall into the bottom of the cradle, which is furnished with a gutter to contain quicksilver; from this the sides of the bottom slope upward to the outlets which are at the side, so that the gold remains in the gutter con-



LAY'S VIBRATING QUICKSILVER CRADLE FOR WORKING PLACER GROUND.

quick, vibratory motion, as an ordinary shaking table. This motion, with the aid of the hopper, separates the coarser particles from the finer, and delivers them at the wheel-end of the cradle and at the same time entirely prevents the dirt setting. On the countershaft are speed pulleys, which work, hy means of a helt, two other pulleys attached to a shaft on the upper crosspiece; the end of this shaft carries an endless screw working into a wheel of 16 teeth. On the axis of this wheel is another wheel, which has the teeth cut away from ahout two-thirds of its periphery; this engages with another, which at each opposite side has one tooth left uncut, hut is hollowed out to receive the plain part of the driving-wheel. Thus at each half revolution it remains stationary until the uncut portion of the driving wheel has passed. When this happens an extra-thickness case on the side of the driving-wheel lifts a detent spring that falls into the hole drilled in the plain part of the follower, and insures the true engagement of the teeth. Now this follower has a cam on the other end of its spindle, which gives a reciprocating motion to a sliding-piece on the hack of the crosspiece, consequently this sliding-piece has an intermittent recipstantly covered hy a small amount of loose dirt. A small pump at the hack of the cradle furnishes the requisite amount of water, which may he reduced to very little when scarce. This machine, which is in use in Australia, could he applied to working the "dry placers" of this continent, since, while some water is necessary, a very small quantity will suffice.

THE Geographical Society of California held its annual meeting on Wednesday night. Pres. David Starr Jordan presented his report covering the work done during the year just passed, and making recommendations for the future conduct of the society. The report shows the total membership to be 420, of which number 37 are life members. Receipts for the year amounted to $3492, and the disbursements $3452.40. Much valuable literature has been donated to the society during the year, and the library is now well supplied with maps, atlases and charts. All of the present officers were reelected to serve during the year with the exceptions of Directors Emeric and Hall, who are succeeded by Andrew J. Maguire and Dorville Libby.

THE TECHNICAL SOCIETY AND THE MAP.—It seems that the Technical Society of the Pacific Coast did not, as stated, oppose the plan of the proposed topographical map of the State. At the April meeting, Prof. W. D. Johnson addressed the society, explaining his plan. Upon motion, it was ordered that the society indorse the plan proposed by Prof. Johnson, and to lend him its hearty cooperation in his endeavors to secure the approval of the authorities of the State; and that a committee of three be appointed to confer with Prof. Johnson in effecting a plan of procedure. The Chair appointed Messrs. Grunsky, Curtis and Vischer, and instructed them to call a meeting for the special purpose of agitating this question; to invite the officers of the State Mining Bureau, the professors of the universities, the State and Federal officers interested, and the reporters of the principal newspapers, in order to create, at once, a public interest in this subject. At the December meeting this committee reported back, with its indorsement, a more detailed statement of the plan, and after much discussion, was instructed to take part in draughting any hill that might he prepared for legislation.

THE total number of steam vessels inspected last year on the Pacific Coast Division of the steamboat inspection service was 679, with a net tonnage of 150,270,58. The total number of officers licensed was 3282. There are five divisions, the Pacific Coast, the Atlantic Coast, the Western Rivers, the Northern Lakes and the Gulf Coast. The Pacific Division holds the fourth place in respect to the work done,

---

BY an explosion of coal gas in the Banfurlong colliery, Wigan, on Wednesday, 50 lives were lost.

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Our latest forms go to press on Thursday evening.

Entered at the S. F. Postoffice as Second-Class Mail Matter.

San Francisco, December 17, 1892.

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Comment.

On another page we print an interesting letter treating of the new mining district of Monte Cristo, near Seattle, in the State of Washington. That the writer limits himself strictly to "a narrative of facts" the manager of the PRESS (who visited the district a year ago) is able to verify. The new district is one of those rare finds where nature has done all the prospecting, leaving the ore veins exposed in plain view. Upon the promise of these natural exposures, something like two millions of dollars have already been spent in railroad-building, etc. A road connecting the district with tide-water, a distance of about fifty miles, is all but completed, and a smelter and reduction works are well under way.

The miners of the silver States are greatly disappointed at the apparent failure of the Monetary Conference at Brussels to help the cause of silver. America alone stands out for the white metal, and it is evident that bimetallism has received a decided setback. Silver has fallen to a very low figure and from all the silver-producing sections come reports of mines closing down. In Colorado, the leading silver State, hundreds of mines, large and small, are curtailing operations or closing altogether. So many men are being thrown out of work that a material influence is exercised on the general condition of trade. In that State large districts are entirely dependent on mining. In Nevada there is a constant depopulation of towns which a few years ago produced thousands of dollars in silver. The Carson river quartz mills, which used to run 328 stamps daily, now operate but 66 stamps. In most of the silver camps very little is being done. Montana is not quite so badly off, yet a number of small silver mines have been compelled to stop work. The State now depends on its copper and gold mines more than on its silver. The Hecla is the only large silver mine which has closed on account of the low price of the metal. The greatest producer of all, the Granite Mountain, is running along as usual, as is the Elk Horn and a dozen other big companies. Of course the profits of these companies have been seriously affected, and if silver goes to 75 cents an ounce not a silver mine in the State will be worked. The greatest damage inflicted on Montana by the depressed price of silver is due to the fact that there is absolutely no sale for a silver mine and but little demand for shares in a silver-mining company. On the other hand there is a great boom in gold-bearing mines, and during the past six months a score or more of great mines, abandoned during the boom days of silver, have been taken in hand by their owners and men put to work developing them. Utah is sharing the depression in silver properties, though not to so great an extent as other regions. In California the question affects our mining population with less directness. We do not produce here quite a million a year in silver. San Bernardino yields most of this, the other counties turning out comparatively small amounts. It is evident that investors will fight shy of silver properties until such time as the metal has some chance of resuming its former position.

THE storms thus far this winter have been highly beneficial to the miners of the placer and high-gulch diggings in the mountains, who have all been busy washing up considerable pay gravel on hand by sluicing. If we have more storms soon, they will be able to continue operations right along during most of the winter, whenever the weather is not too cold to freeze up the ditches and small creeks. In the northern part of the State there are many of this class of mines which pay well during the winter season. It does not take much capital to carry on this class of work, the claim, water and work being all the necessities. In some other kinds of mining it needs money in addition to these features; and, when that is the case, companies take the place of the individual miner.

Diamond Mining in the United States.

The Idaho diamond excitement may amount to something, but we doubt it. No expert in gems or diamantiferous material has expressed any favorable opinion of the ground or the product—if product there be. Prospectors ignorant of this branch of mining have made all the talk about these fields, and diamond prospects excite men more even than gold. More diamonds have been found in California than in any other State in the Union, but they were all small. Several times local excitements have been raised near the gravel mines by diamond finds, but nothing of value, as a field, has been found here or elsewhere in the United States. In fact, a very limited number of diamonds have been found in this country. They are met with in well-defined districts in California, North Carolina, Georgia and recently in Wisconsin, but up to the present time, the discoveries have been rare and purely accidental. These occurrences are chiefly confined to a belt of country lying along the east flank of the southern Alleghenies, from Virginia to Georgia, of Archæan and Cambrian age, and another along the western bases of the Sierra Nevada and Cascade ranges in northern California and southern Oregon. In both districts, the diamonds are found in loose material—the debris of the crystalline rocks of the adjacent mountains. They are in these places usually found among deposits of gravel and earth, associated with garnet, zircon, iron sand, anatase, monazite and particularly gold. The rocks in the diamond-bearing localities of the southern States are mainly granite, and the mode of occurence approaches that of the diamond fields of Brazil and parts of India, but differs entirely from that of South Africa.

In both the regions referred to, as well as Plum Creek, Pierce county, Wisconsin, the diamonds have been found in the search for gold; and in the South and in California, in placer mining, in the flumes and sluices of the hydraulic mines, and in California, frequently, in the batteries of stamp-mills. They have often been overlooked, unrecognized, or destroyed by rude methods of testing.

Mr. George F. Kunz, the gem expert of Tiffany & Co. of New York, who wrote the chapter on "Precious Stones," for the census, sums up the finds of diamonds in this country as follows: The octahedral diamond, weighing 24.75 carats, at Manchester, opposite Richmond, Va., in 1854, which was cut into a gem weighing 11.34 carats; about 100 diamonds, weighing 0.25 carats to 5 carats, in North Carolina and Georgia; about 200 diamonds, from 0.5 carats to 4 carats each, in California; two diamonds in Nevada; seven small ones, some weighing as much as 1 carat, at Plum Creek, Wisconsin; and a few isolated diamonds reported from Idaho, Arkansas and Kentucky. From this authentic record, it will be seen that in number California is ahead, though the value of the total would be small. Thousands of tiny little diamonds were found in the washings of the hydraulic mines, notably at Cherokee, Butte county, and thereabout. They were of no intrinsic value, and no systematic attempts have been made to save them while washing the gold. It would take very few diamonds of any size, however, to attract attention of prospectors and bring about newspaper talk. It is possibly for this reason that the Idaho claims are now to the front. Small diamonds have been found in Montana, and a year or so ago there was much talk of what was to be done in that State, but thus far, none of the diamonds have been placed on the market for sale.

CONTRARY to expectation, the contract for completing the work on Humboldt bay, under the provisions of last year's river and harbor bill, was let Monday to John Bull of Humboldt. His bid was $800,000.

A New Departure in Smelting at Leadville.

During the past year, Leadville, Colo., has taken a new departure that seems to promise a great increase in its production. For several years the lead-silver smelters have suffered for the want of lead, the ores that have been mined containing an insufficient amount of lead to take up the precious metals that they contain. The principal Leadville smelters have been forced to reduce the lead contents of their smelting mixtures to ten per cent or less, and in so doing have exhibited an amount of skill and originality that has not only compelled the highest encomiums of the European scientific journals, but has even caused them to express serious doubts as to the possibility of profitable smelting under such adverse conditions.

The cause of this decreasing proportion of lead to silver has been the constantly-increasing depth of the Leadville mines, which have long since penetrated below the zone of oxidation and reached the primitive sulphide formation, in which galena and zincblende replace the fusible surface carbonates. Copper pyrites also appears in considerable quantities, while the lead minerals decrease, and for some years it has been a question whether it would not be more profitable to the smelters to totally change their methods of reduction and concentrate the precious metals into a copper matte instead of lead bullion.

The Arkansas Valley smelter, a branch of the Kansas City Consolidated Smelting and Refining Co., were the first to conform to the new conditions, and during the past year have erected an extensive copper-matte plant, consisting of crushers and rolls, a large battery of Brueckner's cylinders for calcining the ores, and a number of reverberatory and blast furnaces for smelting the calcined ore.

The copper matte produced at Leadville contains some 250 ounces of silver and 2 ounces or more of gold, and is shipped to the central works at Argentine.

It is here treated by the unique process of Hunt and Douglas, in which the matte is roughly calcined to a mixture of sulphate and oxide of copper, which is treated in stir tanks with a liquor containing sulphuric and hydrochloric acids. This dissolves the copper in the matte, which is converted into a protocbloride by the addition of an adequate amount of common salt.

Sulphurous acid, obtained from the calcination of sulphide ores, is then forced through the solution, which precipitates the copper as a white, heavy, insoluble dichloride, absolutely free from arsenic and antimony. This dichloride of copper is changed into an oxide of copper by the addition of milk of lime, and, being pressed into bricks, is easily reduced to metallic copper by a single fusion in a blast furnace.

The matte residues, consisting mainly of oxides of iron, containing all the gold, silver and lead, are returned to the lead-smelting process, for which they form an admirable flux.

In contrast to the complicated and expensive Levansea system of matte separation, as practiced at the Arjo works, this process is noticeable for its simplicity and cheapness.

The Latest Placer Excitement.

The gold placers near the mouth of the San Juan river, in southern Utah, not far from the Arizona line, seem to be creating a sort of old-fashioned mining excitement, something we have not had for many years. The accounts which we publish in our mining summary give some of the details of the new fields—that is, they are called new fields, but really are not. The country along the San Juan river and the Navajo reservation has been more or less prospected for years. Some placer ground has been found along the river, but none good enough to work with profit. This time some few men may have struck some rich spots and created all this excitement. The Mohave *Miner*, of Kingman, Arizona, says of this field:

Some three months ago, it is alleged, John Williams, an Indian trader, made a discovery of gold placers on the San Juan river, near its mouth. He circulated news of this discovery and in a few weeks nearly 300 claims were staked off. A company of railroad men sent the locators in to do the work. These same men put in their time since the location of the placers, until about two weeks ago, in locating quartz ledges, and, in fact, everything showing a stain of mineral. Now they give out wonderful stories of fabulous pockets of gold and other minerals in that snowclad region. This, in the face of the fact that no work has yet been done on the placer (?) claims, is ridiculous. The first hard work a prospector would do would be to go to work on a placer claim and not run around the country locating "bronco" ledges and receive a salary of $3.50 per day therefor. The San Juan country is now covered with snow and the people who have just gone in there will suffer untold hardships before they can get back to civilization.

The *Miner* probably has the right end of this story. These mines are so far off from here that the exaggerated stories reach us, as is usual in such cases. For a limited

gold field, the miner, to "get in," must he near at hand when the excitement first breaks out. If he has to travel a thousand miles or so he is apt to get left, as those near by will have the best of the ground, if not all of it. The talk about 50 miles of placers and the richest field ever discovered in the United States is nonsense, when it is known that for some years prospectors have been over this ground. That rich placers might now be found, which were overlooked by others, is probable, but this is not enough to draw some thousands of men away from their homes in winter to a wild and unsettled region. Old-timers in Arizona, who know that country, acknowledge that it falls short of being a mineral section. Of course, any one foot-loose and free, and with money to spare, could go to the new placers and try his luck; but men who are at work would be foolish to give up their jobs to wander off to southern Utah at this time of year on no better basis than the telegraphed reports, prepared by excited men ignorant of mining, and on information furnished by interested parties.

Foundry Notes.

Business continues rather dull among the foundries, nearly all complaining of lack of work. It is evident that the larger iron works of the city will have to follow the lead of the Union and go into shipbuilding as a leading feature. This the Fulton has already prepared to do, and the Risdon, which now does considerable marine work, will take steps toward obtaining better facilities. This being the greatest seaport of the Pacific, there is more or less repair work always offering, and with more complete facilities, more will be done. Cheaper drydockage is greatly in demand, the present prices charged being so heavy that large vessels do not go on the graving dock unless absolutely compelled to, preferring to take their chances at other ports. With several good large drydocks along the bay-shore, there would be much more business done. The Union works now has one, and the Fulton will have another. These, added to the small Merchants' drydock and the big one at Hunter's Point, give a goodly number. The Risdon will doubtless build one in the near future, and Turner, the Benecia shipbuilder, talks of having one at San Francisco. Possibly the ironwork, etc., of the old floating docks of Mare Island Navy Yard, soon to be sold, may be utilized for similar purposes here.

The fleet of steam schooners running on this coast have done much to bring forward marine work in our foundries. Formerly all the small coasting trade to the lumber ports was done by sail, but now the steam schooners have largely displaced the sailing-schooners. The engines, boilers, pumps and other machinery of these vessels have been built in this city, and are as good as can be fonnd in any part of the country. The types of engines are the most modern and approved, and are economical in fuel and operation.

It has been demonstrated practically that not only can first-class warships and cruisers be built here at economical figures, but large-sized passenger steamers as well, so that all classes, large and small, may be constructed advantageously in San Francisco.

There is room for more of this work to be done and the business will not remain in the hands of one company alone much longer. The credit of advancing this interest to its present position rests with the Union Iron Works in the matter of the largest vessels, though the other foundries have long been doing their share of smaller marine work. They would have sooner competed in the large class had their facilities for docks, wharves, etc., permitted. These, as stated will soon be provided, and it is to be hoped that there will be enough work to go round among them all.

The Monterey has received aboard the last of her heavy guns, been in the dry dock for cleaning, and on Saturday will be tested in the bay. A few hundred tons of pig iron will bring her to sea-going trim. Capt. Chas. Minor Goodall will have charge of the vessel during the trial, and will run her straight away from Mission Rock to Red Rock, about 11 miles. She will not go outside, but the horsepower tests will all be made on the bay. The Union Iron Works people are nearly through with what they have to do on the vessel.

Martial Hainque, who died on Sunday, was well-known among the foundrymen here, being proprietor of the Cyclops Iron Works. He had resided in this city 38 years. He came here in 1854, from France, with his father, and after a few years' service with the late Frank Curry, proprietor of the San Francisco Boiler Works, as bookkeeper, he, in 1858, entered the Vulcan Iron Works as an apprentice and learned the trade of machinist. He established the Cyclops Machine Works at 115 and 117 Beale street about 18 years ago, and carried it on under the firm name of Tait & Hainque up to six years ago, when his partner, Mr. Tait, retired. He afterward carried on the business alone.

Personal.

FOSTER S. DENNIS, a mining capitalist of Kingman, A. T., is in the city.

S. A. STEWART has bought the Gipsy quartz mine, near Shasta, from George W. McDaniels.

JOHN MCCALL, of Trinity Center, reports a rich strike on abandoned ground near Minerville.

S. S. TAYLOR, who is arranging for the World's Fair mining exhibit of Plumas county, is in town.

T. B. BUNTING, who is interested in the Santa Cruz county bituminous rock deposits, is at the Palace hotel.

MAJOR FRANK MCLAUGHLIN, manager of the great river-bed mining operations at Oroville, is visiting the city.

H. AND J. PAIGE, J. E. and C. O. Drury have located in the Shasta mining district what is known as the Drury mine.

Mr. J. H. NEFF, president of the State Miners' Association, is still confined to his home at Colfax, by reason of injuries received last week.

A. C. HAMILTON, superintendent of the Potosi, Chollar, Bullion and other Comstock mines, has arrived here from Santa Monica, where he has been visiting.

L. S. HOLLIDAY of Ashley's Fork, Uintah county, Utah, is from a new mineral country which he says is very rich. The new district is about 90 miles from the railroad.

GEORGE A. MEEARS, manager of the Meears group of mines, Utah, has closed a contract with Philip Morgan, to sink the shaft deeper and explore some of the ground.

SUPERINTENDENT R. C. Chambers, of the Ontario mine, Park City Utah, has gone East. He says the resumption of dividends by the mine depends mainly on the price of silver.

THE comet medal of the Astronomical Society of the Pacific has been awarded to Prof. E. E. Barnard for his discovery of an unexpected comet by photography on October 12th.

A. P. MINEAR has transferred to the Bristol Mining Company the Trinity, Stonewall, Sitting Bull and Tehama mining claims and a 10-stamp mill, all in the Dog creek mining district.

PROFESSOR MORTON, superintendent of the Mammoth mine in Old Diggings district, Shasta Co., reports a rich strike, the quartz being liberally sprinkled with gold and running high in sulphurets.

PROF. FRANK SOULE, of the University of California, delivered a lecture on Wednesday evening in the hall of the California Academy of Scieuces on "The Development of the Science of Astronomy."

J. D. POPE, a former employee at the Bi-Metallic mill, Montana, has taken charge of the Algonquin mill for the McKechney Milling Co, and he is meeting with good success in the treatment of Puritan ore.

PROF. E. L. GREENE, assistant professor of botany at the University of California, has been promoted by the Regents to the professorship of that study. The compliment is deserved, since Dr. Greene is the most distinguished and skillful botanist in California.

JAMES PARK, who secured a bond on the recently discovered gold property of J. A. Brim and others, lying between Ely and Cherry creek, Nev., has gone to New York. The bond is for $100,000, and a payment is to be made in 36 days. Mr. Park is acting for a party of New York capitalists.

Coast Industrial Notes.

SALT LAKE is to have a large plant for the refining of asphaltum.

THE four-masted British ship Andelana, Captain Richards, arrived last week from Kuchinotzu, 80 miles from Nagasaki, with 3530 tons of Japanese coal, after an excellent passage of 37 days. Ships bringing Japanese coal cargoes to this port are rare.

THE mineral paint works of Messrs. F. Boehmer, Carl Petersen and Henry Mohres were destroyed by fire on Monday, resulting in a loss of $15,000, partially covered by insurance. The works were located on a hillside back of Fruitvale, Alameda county, near the Laundry Farm quarry, whither they were removed a year ago from the North Alameda tract. The machinery was expensive, having been brought out here from the East.

WORK is going right along on the Monadnock at Mare Island Navy Yard. The boilers, engines and auxiliary machinery will soon be put on board and completed as fast as possible. Considerable work of a minor character will be done about the yard buildings and officers' quarters during the next few months, in the way of putting in heating apparatus, painting, etc. A gang of wharf-builders has, during the past week, been taking advantage of the tides and working long into the night on the foundation of a piece of the new section of quay-wall under course of construction south of the stone drydock.

THE S. P. Taylor Paper Company intends to begin the manufacture of writiog and fine papers. The machinery is on the way, and the company expects to he in full operation not later than March 1st, and will give employment to not less than 100 hands, aside from twenty-five to thirty girls in the finishing departmeot. The S. P. Taylor Paper Company is the projector, the late S. P. Taylor having erected the first paper mill on the coast, as far back as 1856. In 1883 a new and much larger mill was erected alongside of the original plant, to which was added, a year later, a bag factory with an output of over 1,000,000 bags daily.

THE first of the new Spanish-American line of steamers to complete a round trip arrived Sunday when the Grandholm dropped anchor, fifteen days from Corinto and way ports. Her consignees are Otis, McAllister & Co., resident agents of the new company. The steamer's manifest shows a total freight of 1,122 bags of new crop coffee, divided by planters shipping from the three ports of San Jose de Guatemala, Champerico and Ocos. The new line has heavy engagements ahead of it, both up and down, and it is more than hinted that it will cut a prominent figure in the war between the Pacific Mail Steamship Company and the Panama Railroad Company.

THE Columbia river salmon canners' conference resulted in nothing. The object of the conference was to foster the salmon industry and protect brands and trade marks. All was perfectly harmonious on these subjects, but when the proposition to form a combination to protect the interests of the cannery men came up, the conference disagreed. It was stated that the canning business on the Columbia river had been carried on at a loss for several years, and unless some plan to keep up prices was agreed upon, serious results would be certain to follow. A plan of incorporating all the canneries on the river into one company and operating them under one management was proposed, but the diversity of opinion was so great that no definite result could be reached.

THE new canal scheme at Yuma is being pushed as rapidly as men and money will do it, and will, in all probability, be completed within the next year. The water will be taken out of the Colorado, a distance above Yuma, and will be distributed over the mesa lands lying in the Hermosa district, reclaiming hundreds of thousands of acres. It will not only be of benefit to the agricultural interests, but the mines will profit much thereby, and many that cannot be worked at all now, for lack of water, will be opened up. Mr. Blaisdel of the Yuma Pumping Company is erecting a system of pneumatic pumps that will supply the city with water at a very cheap rate, electric lights, ice and all the accompanying industries being included. The prison will be furnished with light and water by the same company at a much more economical figure than they necessarily cost now.

THE Haywards electric road has completed its track as far as Thirteenth and Webster streets, and early next week its cars will run into Oakland. The road will run from the Narrow-gauge depot to Clay street on the tracks of the Berkeley electric road, and on Washington and Clay streets it will share the franchise of the Piedmont Company. The latter has a franchise for a double-track road on those two streets, but owing to the narrowness of the streets only a single track was laid on each, the cars making a loop at Eighth street. The property-owners have bitterly opposed another track on Washington street, so when the Haywards road got ready to build on Saturday a large gang of men were put to work, and the job had been half completed before the property-owners knew what was going to happen, and before the threatened injunction could be brought. When the double tracks are finished they will be shared by the Fourteenth-street and Haywards electric roads and the Piedmont cable road, the first being a branch of the latter road.

THE flour-millers of California have ceased night work and have cut down wages and discharged a number of men. The men working in the mills are divided into skilled and unskilled workers, and as a matter of course their pay differs correspondingly. A practical miller's wages have for years been from $4 to $4 50 for a day's work of 12 hours. Floormen, sacksewers, drivers and laborers were paid correspondingly. The first intimation of a reduction came in the shape of an order that the sacksewers, who were paid $3 a day would only receive $2 50 hereafter. Then came a notice in many of the mills that the establishments, which had been for years running night and day without intermission, would no longer continue to operate at night, and that all men working on night shifts were discharged. This latter threw a large number of men out of work, and is the cause of much misery and malcontent. Among the shippers and dealers in produce there is no reason known why the mills should reduce wages and hours just now. There is no fall of prices and no surplus in the flour market, so that the action of the combine is considered quite arbitrary and uncalled for.

THE Adams Reservoir, Power and Irrigation Company intend to impound on suitable tracts to the north of the Arizona canal, a vast amount of water, to be drawn upon in times of scarcity and to irrigate new lands. The first reservoir will head at the Arizona canal falls. The north bank of the canal will be raised to a height of 25 feet, with a thickness of 15 feet on top, sloping away gradually on either side, so as to insure perfect safety. By means of this retaining dam, a lake will be formed four miles in length and over a mile in width. From this reservoir, a large ditch will be run, connecting with an equally as large reservoir several miles farther to the westward. Here the extent of the land as covered will be less, but the retaining wall will be built up to the height of 30 feet. These two reservoirs are filled with the surplus water of the great canal during the winter months, and their store of water will then be reserved until the summer. This will contribute a stream of 4000 miner's inches for six weeks before exhausted. The work will start at once, though it is not expected to be completed in time for any practical benefit to be experienced during the coming summer.

THE Igo and Ono mining districts in Shasta county are year by year increasing their output of ore, containing both gold and silver. Such as will bear railroad charges is sent to Vallejo Junction for reduction, comprising from one to two carloads a month. Now, as these mines are being developed and the output greater, is not there as much, or even more, being thrown aside as waste? If it could be shipped to some near point where charges are nominal, could it not be made to pay for reducing? The present outlook of these mines is that they are good for many years to come, and the owners are sanguine of their stability, which is vouched for by the fact of their expending large sums of money for machinery, etc. Not only are these mines receiving immediate attention, but there is a group of mines in the northern portion of this county

near Pitt river, which will soon be reached by the railroad operated now by the Shasta Lumber Co., that can be worked on a paying basis, provided cost of reduction and transportation was nominal. It seems to the Anderson Valley *News* that the prospects and stability of the surrounding mines, whose output of ore could be centered at that point, is sufficient for some person who is looking for a point to erect reduction works to give it earnest attention.

PLENTY of water is insured for next season, if the Truckee *Republican* is a true prophet. It says: "If all the snow that has fallen had remained on the ground without being packed down by the rain, we would have about six feet on the level. As it fell on dry, dusty ground, and there has been no such melting as causes the rivers and streams to rise, it is clear that all this amount of moisture is going into the ground. This insures plenty of water next year. The ground is not frozen at all, nor can it freeze until all this covering of snow disappears. The earth will be thoroughly soaked, and the valleys will see good times at the next harvest. Sometimes the ground is partially wet from rains when the first freezing weather comes, and in such years the snow that falls melts and runs away without penetrating the frozen earth. In such winters it makes no difference how much snow comes, the ground is comparatively dry in the spring. This year, it is safe to predict that nearly all the snow that falls will soak into the soil. Bodies of snow on the mountains are like great reservoirs, holding the waters for use in the springtime. A greater reservoir, however, is the earth which covers the mountains. If this earth can be filled with water, there is no danger of drouth. Every brook and rivulet will be filled with water until late in the summer."

THE Southern Pacific Company has commenced work on the Kentucky street electric road, which is the beginning of a work which will, in time, do away with several horse-car lines. During 1893 the company will build over 20 miles of rapid-transit lines, 15 miles of this being electric and five miles cable road. Material for the entire system has been ordered, and as fast as it arrives it will be put in place. The Kentucky-street electric road, now being built, begins at Fourth and Townsend streets and will run out Kentucky street to Railroad avenue to South San Francisco, covering a distance of about three miles. This will open up a part of the city heretofore comparatively isolated. Still more important is the Mission-street road, to be built from East and Mission streets, on the water front, out Mission street and Mission road to the county line, a distance of eight miles. Work on this line, which will also be on the electric system, will be begun about January 1st. While these two roads are being built, construction work will be begun on two connecting lines which will tap the most populous district south of Market street. One of these will run from the junction of Solano and Kentucky streets to Sixteenth and Mission, where it will connect with the main line. The other will start at Center avenue and run down Kansas street to Brannan, down Brannan to Sixth and down Sixth to Mission. Power for this extensive system will be generated at one central point and from there distributed over all the lines. The plant will be one of the largest of its kind in the United States and will consist of the most approved machinery. The new cable road to be built by the company will start at Bay street on the north side and run up Fillmore street to Market, and from Market out Church street to Thirtieth street. Eastern manufacturers of electrical appliances have received orders for designs of their latest improvements in electric cars and motors, and the new roads will equal any now in use.

The Pielsticker (Cyanide) Process.

1003 DEVISADERO ST., SAN FRANCISCO,
Dec. 11, 1892.

TO THE EDITOR:—In the Dec. 3d number of the MINING AND SCIENTIFIC PRESS, one of your able correspondents records a marked failure of the cyanide process at a mine in Placer county. This is only one of many, we fear, because it has been notorious all along that our most successful mining men and metallurgists have not been obtaining the results claimed by the owners and their allies. But now comes the Pielsticker method from London, and if half its advocates pretend and the following circular be true, we have now a really genuine cyanide process. The circular says:

The process for the extraction of gold and silver from refractory and other ores, concentrates and tailings by means of cyanide, has been known for many years; but it is only at a comparatively recent period that various difficulties have been overcome, which enable the process to be worked profitably on a commercial scale.

Although the working of the cyanide method has proved it to be far in advance of all other ways of recovering gold, yet several articles have remained to be overcome ere the process could be considered perfect. These difficulties have been the subject of many experiments and exhaustive trials, and have resulted in the Pielsticker (cyanide) process, which possesses advantages acknowledged by scientific experts and metallurgists to be in many respects unique and in advance of any other cyanide process.

The Pielsticker process will effect not only all that is claimed for other cyanide processes, but also:

1st—The method of working has been considerably simplified and its cost reduced.

2d—It has been found in practice that when treating the ore with cyanide, not only is the gold dissolved and extracted, but base metals are also attacked to a considerable extent as well. This is practically obviated under the Pielsticker process.

3d—The quantity of cyanide used is less than in any other process.

4th—By the Pielsticker process every kind of ore can be successfully and profitably handled, whereas the following difficulties have not been overcome by any other cyanide process:

(a) In many refractory ores the precious metals are so encased that the cyanide of potassium is practically inoperative on the gold and silver.

(b) Many ores containing base metals in the form of oxides and carbonates (particularly of zinc and copper) consume so much cyanide in dissolving them, that the extraction of the precious metals ceases to be commercially profitable.

The Pielsticker process is rapid and effective. The plant required is of the simplest character, cheap and easily managed. The loss, delay, and heavy expense attendant on roasting the ore is entirely obviated, while the process is equally adapted for the treatment of refractory ores, concentrates of both high and low grades, sludges, gold-bearing sands, and also ores containing base metals in the form of oxides or carbonates (particularly zinc and copper), which up to the present have not been successfully treated by any other cyanide process.

For the treatment of ores containing "fine" or float gold, the process is specially suitable, as the smallest particles even are absorbed by the solution. In this respect no other process can approach it.

Numerous companies pay small dividends or have ceased working altogether, notwithstanding rich assay results, on account of the refractory character of the ore, which cannot be handled profitably by the usual methods. The Pielsticker process, however, readily treats ores that have hitherto baffled all efforts at securing their valuable (but practically locked up) stores of the precious metals. The assay value, however rich, is frequently small indication of the practical results obtainable from working refractory ores that will yield neither to chlorination nor amalgamation.

The working cost of the process varies according to the nature of the ore and surrounding circumstances; from 8s to 15s per ton may, however, be taken as the average cost.

Then follows an expert's report verifying all the claims made for the process, and it is about as reliable as such things usually are. No hint is given as to details or manner of working, which is unfortunate, as people who have paid for their experience are somewhat cynical about taking anybody's word in regard to new methods for treating ores either by chemical or mechanical means. However, the missing information will trip along hereafter, no doubt, and let us trust that experiment will then prove "the coming process" has come at last. T. CALLAHAN, M. D.

Establishing Right to Unpatented Mining Claims.

SAN FRANCISCO, Dec. 10, 1892.

TO THE EDITOR:—In an editorial of week before last, you invite discussion of difficulties now encountered in the way of establishing right to unpatented mining claims, and ask for suggestions of remedy.

A suitable criterion of "mineral character" is not easy to establish. We may desire that all lands in localities known to be valuable for its mineral shall be regarded as mineral lands until the contrary is shown. But who is to determine what shall be the boundaries of such localities? And how long will it take to prove that any particular piece of land is not mineral? Can it ever be shown that it does not contain blind deposits?

It appears to me that before the Land Office can properly be called upon to reserve undeveloped ground for mineral claimants, it must be shown specifically what particular lands should be so reserved. This cannot well be done without some systematic investigation to determine the boundaries of our mineral districts. Some of our congressional laws are too loose; we require something more definite.

It is a notorious fact that the mining profits of many of our best districts have been expended in legal controversies. The most prolific sources of dispute have been:

1st. The granting of extra lateral right to lode claimants, *i. e.*, the right to follow and work a lode on its dip into neighboring ground.

2d. The absence of recorded proof of the exact boundaries of locations.

3d. The absence of satisfactory means of showing when a claim becomes subject to relocation.

It is thought by many that the Mexican law is better than ours in respect to these matters. Extra lateral rights are not granted. The government surveyor marks the boundaries of the location, and the claimant is officially put in possession. There is no requirement of annual work (under the new law), but the claimant is required to pay an annual rental to the Government.

Our mineral resources have been developed so rapidly, and there have already accrued extra lateral rights to such a vast number of lode-claimants, that it would probably be regarded as rather late to inaugurate a change in this respect.

However, a uniformly applicable remedy for the other difficulties might well be instituted without any conflict whatsoever with accrued rights I will sugest the following:

Let the present requirement of annual assessment work be dispensed with.

Let there be substituted an annual rental of $50 for each location until patent is obtained, to be paid to the U. S. Government, a readily accessible record to be kept.

Let the absence of such record open the claim to relocation.

Let the monies accruing from such payments of rental constitute a fund to be used for the benefit of the districts, as hereafter indicated.

Let the States be divided into suitable districts for the purpose.

Let there be appointed a competent mineral surveyor—a government official—for each such district, to reside in the principal town of the district, and to receive an adequate salary to be paid out of such fund.

Let it be such surveyor's duty to prepare a map of the district, showing all patented claims and all mineral locations which have been officially surveyed.

Let it be required that all unpatented claims, not already officially surveyed, shall be surveyed and properly marked under the direction of the mineral surveyor. Let this be done within a period of say one year after the appointment. Let the fees to be paid for such surveys be properly designated and be paid out of the above fund.

Let there be designated a proper system of marking the boundaries of claims.

Let it be required thereafter that all new locators shall apply for survey within say 60 days after the date of location.

Let the mineral surveyor be required to keep on file, subject to public inspection, a copy of the map of claims and a record of rentals paid.

Let copies of all such maps be filed in the Land Office and form the basis for determining what shall be regarded as "mineral land." This may be effected perhaps by the appointment of a properly-qualified commission to give the matter careful study, involving the examination of typical districts, and to formulate definite instructions to guide the various mineral surveyors in outlining the ground to be regarded as mineral.

Pending this work, let the miners' interest receive due regard; let there be some broad designation of the mineral belts, in which the lands shall be temporarily withheld from applicants for agricultural patent; let the listing of such lands to the railroad companies be temporarily stopped.

ROSS E. BROWNE.

Magnetic Separation of Zinc Ores.

In the dressing of calamine vein stuff at the Monteponi mines in Sardinia, an intermediate product is obtained, in the form of a mixture of zinc-silicate (electric calamine) and ochre, containing zinc and iron in extremely variable proportions, together with some dolomite, which minerals, being nearly all of the same density, are not susceptible of separation by the ordinary methods of dressing with water. For the treatment of this material a process has been devised by the author, consisting of a partial reduction of the ferric oxide to magnetic oxide, and separation by an electric magnetic apparatus, differing in many particulars from other machines previously used for the same purpose, which has been in successful operation since May, 1890.

The preliminary roasting is effected in an Oxland calciner, made of an old boiler shell, 13 meters long and 1 meter in diameter inside the firebrick lining, laid at a slope of 1 in 15 from the feeding end toward the firebox. The shell is surrounded by five hoops, four of which run upon the supporting friction rollers, formed of four pair of railway wheels placed with their axles parallel to the length of the furnace, while the fifth, in the center, is provided with toothed gearing, receiving motion from a screw, which turns the cylinder at the rate of 16 revolutions per hour. The fireplace has a horizontal grate of 1 5 square meter area, with a closed ash pit and airblast. A deep layer of fuel is kept on the fire bars, in order to produce combustible gas, which is afterward burnt by heated air, giving a long flame in the furnace. The ore, mixed with 2 per cent of finely-ground coal, is passed through the furnace, the iron being transformed to magnetic oxide and the dolomite rendered caustic. While still warm, it is spread out on a floor and slightly moistened with water, which slacks the burnt dolomite, disintegrating it to a fine dust, which remains with the smallest-sized ore after the magnetic separation, but is easily removed by a final cleaning in a jigging machine.

After cooling, the roasted ore is raised by a bucket elevator to sizing-drum, where it is classified into five sizes, with the limits 0, 1, 1.6, 3, and 6 millimeters. The four finer sizes are distributed by vibrating shoots, made of sheet brass upon the magnetic wheels, while the larger material above 6 millimeters is passed through crushing-rolls and returned to the elevator for sizing.

The magnetic wheels, of which there are four, one for each size of those classified, are all of similar construction. A central boss of cast iron, mounted on a horizontal axis, carries an even number (twenty is the figure) of radial poles, carrying bobbins wound with covered wire at their ends. The arms are covered by a cast-iron ring, bounded on each side by a disc of zinc. The winding of the bobbins is carried from one pole to another, forming a continuous closed circuit. Between each arm, a branch wire leads to the commutator, which is attached to one of the zinc side-plates. This consists of a number of copper strips, corresponding to that of the arms, which are arranged alternately, upon concentric circles in such a manner that the two brushes placed opposite to each other must be in contact with at least two segments at the same time. When the current from a dynamo is passed through the brushes, it is divided in the circuit of the bobbins, and excites opposite polarities in the two halves of the circuit, but as each brush is in contact with two segments of the commutator, no current will pass through the bobbin between them, so that the corresponding segment of the wheel forms a neutral zone between the north and south polar halves. The brushes are so adjusted that the neutral axis lies midway between the horizontal and vertical planes, so that the non-magnetic minerals in the mixed stuff, which is fed on to the top of the machine, fall off after passing the horizontal position, while the magnetized particles are held until the surface meets the neutral axis on the opposite side, when the attraction is broken and they fall into the iron-ore bin.

The rim of the wheel is in contact with the poles, and the magnets may be made either of cast iron or any non-magnetic material, such as zinc or brass. In the former case, although the magnetic attractive power is lessened, it increases regularly from the neutral zone to the position of maximum north or south polarity, so that it becomes possible to separate minerals of varying magnetic character from each other. The working surface is divided into cells, either by teeth or a grating of radial and transverse bars of iron, forming an armature which closes the magnetic circuit and concentrates the attractive power in the cells. The spacing of the bars, and the size of the apertures between them, varies with the grain of the material to be separated, the latter being kept to the right side by copper stops laid between the bars.

The magnetic wheels make from 12 to 20 revolutions per minute, and require an average current of 60 amperes at 30 volts tension, corresponding to a net electrical effect of 4-10 H. P., which is derived from a dynamo, which also serves for the electrical lighting of the works. The apparatus was set at work in May, 1890, and during the first twelvemonth about 5000 tons of crude ores, containing 20.17 per cent of zinc, were treated, producing 1530 tons of merchantable zinc ore of 41.67 per cent produce. During the present working year, the assay of the cleaned ore has been improved to 45 per cent.—*Oesterreichische Zeitschrift fur Berg und Huttenwesen.*

The Monte Cristo Mining District, Washington.

TACOMA, Wash., Dec. 7, 1892.

TO THE EDITOR:—The construction of the Everett and Monte Cristo railroad 50 miles eastward from Everett into the heart of the Cascades, is the most important movement yet made toward the development of the gold and silver mines of western Washington. The mineral wealth of the country is unquestioned; discoveries of varying value have been made along almost the entire length of the western slope nf the Cascades, from about Mt. St. Helens in Skamania county, to Ruby creek, close up under the boundary line of British Columbia. The extent, frequency and contiguity of these discnveries no longer permit of doubt that the section must become in time a great mining area. The opening up of Monte Cristo is the initial enterprise, projected on a large scale, in the mining activity of the country.

Physical conditions have hitherto prevented and will doubtless, to some extent, continue tn retard the rapid development of the region. The whole western slope from the mountains to the coast, is cnvered with an almost impenetrable blanket of forest—a literal jungle. Few trails, and fewer wagon roads exist. Again, the ores of the country are not, as a rule, especially high grade and little or no free gold has been found this side of the range. Placer mines are few and far between. Shipments by wagon over such roads as are to be found in the western half of the State are almost precluded. Railroads are an eminent necessity. Thus, though the existence of rich districts, notably that of Silver Creek, have been known for a number of years, such is the character of the country that it has been little prospected until the last two or three years.

The district of Monte Carlo was discovered three summers ago, but it has required the time intervening to interest the requisite capital to build a railroad in and provide for working nn a large scale. The road will open up several districts of fine promise, while the completion of the Great Northern road through to Everett will open up another tier of districts just to the south. These two roads will overcnme the most formidable barrier to successful working, and must lend a strong impetus to the mining activity of the section.

Monte Cristo, the present center of interest, lies in the depths of the Cascades, or, perhaps more accurately, in the spurs forming their western slope, at about the middle of the eastern line of Snohomisb county. The basin is at the headwaters of the Sauk river and is divided from the older district of Silver Creek, six or eight miles to the south, only by a clean range. It was discovered by J. L. Pearsall, better known as "Jo," in the summer of '89. Pearsall was an exschool-teacher, turned prospector. He had been knocking around Colorado and Idaho since the late Leadville excitement, and laoded in Silver Creek in the hey-dey of the latter's boom, "broke." It was curious that the lateral area of Silver Creek had been widely prospected and in that and the Troublesome and Howard Creek districts some 2000 locations had been filed, no attempts had been made 10 explore over the divide at the head of the creek. It was in this direction that Pearsall turned, armed with a grubstake and a fieldglass. The latter proved a valuable accessory and revealed a huge red stain, some miles to the north. The way to it lay across the thin edge of a hogback and over a huge glacier. Tbe ledge that attracted Pearsall's attention through the glass, he never reached tbat year, at least, but stopped as he came upon another of even greater extent. It proved a vein from 40 to 75 feet wide, rich with mineral, and exposed in its face from the bottom of the gorge, up 2000 feet to where it disappeared beneath tbe glacier. Planting his stakes, he named it in honor of its discovery on the 4th of July—"Independence of '76"

On his way down to Snohomish to place the location on record, Pearsall ran on J. M. Wilmans, one of the Wilmans Bros. who had just achieved their exploit with the Woodside mine at Park City, Utah. The Woodside was abandoned, when F. W. Wilmans, an Arizona mining man, came along, found the lost lead, leased the plant, and in the course of a few months took some $625,000 from the mine. F. W. Wilmans came on and returned with Pearsall to the scene of the latter's find. Further prospecting revealed several other immense ledges, exposed to a similar extent. These were promptly corralled, and the succeeding summer a trail cut through from Sauk City, at the junction of the Sauk with the Skagit. The next question was a railroad.

Just at this time, a syndicate of New York capitalists, headed by the banking firm of Colby, Hoy & Co., were undertaking to build a new manufacturing city at the point where the Snohomish river empties into Puget Sound, 30 miles north of Seattle. The new town, Everett, was the nearest point on the sound to the district, and its projectors saw the importance of making the latter tributary to their enterprise. The Colby-Hoyt interests undertook the construction of the road on a sufficient guarantee, and work was begun last June. The syndicate subsequently made some heavy investments in the mines, and now controls several of the leading companies. A coalition of interests was effected and the development of the district pushed forward on a broad scale. In all about $3,000,000 will be required for the work of development, all of whicb, in fact, must be expended before a dollar of return can be had. At Everett the construction of a smelter was undertaken by the Puget Sound Reduction Co., formed of the principal interests of Monte Cristo. Tbe cost of the present plant is $300,000, with facilities for enlargement as shipments shall demand. It will be completed this winter, and will be the largest smelter on the North Pacific. Three 80-ton stacks and two improved roasters, equal to six of the old pattern, will be employed, and the works equipped with modern devices througbout. The company has secured a fine location on the waterfront, facilitating easy handling of foreign ores.

The 50 miles of railroad through a virgin forest will require $1,800,000. A short and easy rnute was found up the south fork of the Stillaguamish, and over a low pass intn the valley of the Sauk, five miles below Monte Cristo. At the latter a concentrator will be erected at a cost of $250,000, and from this an extensive system of tramways will reach to the varinus mines.

Six principal companies are now operating in the district, controlling about two-thirds of the locations made. The Colby-Hoyt syndicate nwns a controlling interest in three, tbe Pride of the Mountains Co. owning the Pride of the Mountains, the Rainy Company owning the Rainy mine, and the Monte Cristo Co. owning the '76, Mystery, Emma Moore, Congress, Ibex, Pride of the Woods, and several others; Joseph S. Colby, of Cleveland, O, is president; F. W. Wilmans, of Seattle, vice-president; Chas. L. Rand, of Cleveland, secretary; Wm. C. Butler, general superintendent, and A. L. Dickerman, consulting engineer. The Wilmans Bros are in control of the Wilmans, Pearsall and Pearsall Blake Companies, owning the Monte Cristo, Onida, Alacante, Fourtb of July, Ironclad and several others. F. W. Wilmans is president; Edward Blewett, vice-president: J. M. Wilmans, treasurer; J. L. Pearsall, general manager of the Pearsall Co., and George Blake superintendent of the Wilmans Co.

The district of Monte Cristo is made up of two huge basins, from 2000 to 4000 feet in depth, parallel and joined at their western extremity, proceeding thence in widened and deepened course to form the valley of the Sauk. These great furrows have been ploughed through the mountains by two immense glaciers, drifting to the northwest on the back of the long bigb mountain ridge which parts the two basins; the remains of which old ice-monsters still lie, unmelting in hottest midsummer. The mineral ledges are found traversing the two basins in parallel lines, nearly at right angles to the basin's walls; they have thus been cut sharply across their face, exposing them to great depths. It is indeed in the surface showings that the district finds its most marked physical characteristics. The extent of this exposnre is something wonderful, and from its character established the immense resources of the district before any great amount of development work had been done. Nature had in fact done the development work, and a considerable share of the mining. Practically, all that is required is to run tunnels at feasible levels aod stope down tbe ore.

The ledges are traceable for a number of miles on either side of the district, and for the most part maintain nearly parallel lines. Thus, in their continuity, parallelism and the great depth to which they are exposed, they exhibit the strongest possible surface evidence of permanence. This had been thoroughly borne out by extensive development work in all of the larger ledges. The following presents the results of the work on the more important leads:

Pride of the Mountains mine—Between 300 and 400 feet of tunnels showing vein from 8 to 28 feet wide; solid ore body, 6 to 14 feet wide, largely galena, with some pyrite, b'code, aotimony aod arsenic; assays from $30 to $60 per ton. One hundred feet above tuonel, outcrop of 8 foot vein of solid galena assays $79 in silver and 58 per cent lead. This vein is exposed in a continuous outcrop for 4000 feet, cuttiog the mountain obliquely and forming a solid girdle of ore three-quarters of a mile long. There are about 3000 tons of first-grade, direct-shipping ore on dump, stoped from exposed face of vein at mouth of tunnel—quarried would be a better word.

'76—Three tunnels of about 100 feet each have been run in the country rock to tap the vein from beneath. Vein is exposed for a distance of about 2000 feet and is from 25 to 75 feet in width. It lies on one side of the huge mountain-spur or ridge which divides the two basins and outcrops on the opposite side of the ridge, indicating a solid mountain of ore. Assays from 28-foot face, $30 in silver, $22 in gold, and 26 per cent lead. The ore is for the most part a heavy concentrate carrying more gold than the Pride—is largely a galena and pyrite, averaging about $40 to the ton.

Monte Cristo—Three tunnels, tapping the vein at different levels, have developed a fine body of direct-shipping ore. The ore body is from 5 to 8 feet in width, in a vein 14 to 15 feet wide. The mine is situated in the same way as the '76, and on the opposite side of the ridge lie the Onida and Alacante. These latter will be worked by tunnels driven from and along the ledge of the Monte Cristo, the tunnels being from 2000 to 3000 feet long. Assays from various depths of long tunnel, maximum $98, average, $60 to $70. Tramways are now in place to the Monte Cristo, and with the completion of the railroad the mine will be ready to ship from 100 to 200 tons of ore daily.

Mystery—Two tunnels, one of 100 feet and a second of 150 feet, traverse vein of solid ore averaging 8 feet in width. The ore has been left standing and workmen are now drifting on through, following veio to opposite side of the mountain where it outcrops in Glacier basin. This is largely a gold-bearing rock, an arseno-pyrite, carrying no lead. The ore averages about $40 per ton, and a large quantity is ready to be stoped and shipped.

Rainy—Two tunnels of 150 feet each have opened up vein 20 to 30 feet wide, largely a gold rock, carrying no lead; assays from face of end of tunnel show $70; is largely a concentrating ore.

Emma Moore—Two tunnels cut three-foot seam of direct shipping ore, largely a galena, carrying $50 per ton.

Congress—The 150-foot tunnel opens up two seams of aggregate width of three feet. Assays from narrow seam at depth of ten feet showed $90 in silver, $35 in gold and 51 per cent lead.

Assays from pay streak of the Ironclad ran $100 to the ton, and concentrates from mine average $40 per ton. Development work in smaller mines has had proportionate results.

In general character, the ores of the district are a galena and pyrite, carrying considerable arsenic, some antimony and some blende. They may be said roughly to average from $30 to $50 per ton, and are about 60 per cent concentrates. The bulk of them are smelting ores, carrying heavily in lead, but some will require roasting and treatment. Taken as a whole, the mines of the district are remarkable not so much for the rich streaks of high-grade rock, but for the immense bodies of ore they contain. In several instances, as the '76 and Monte Cristo, the ore body is practically the thickness of the mountain, naturally "in sight."

I have in tbis account avoided anything partaking of the line of superlatives and confined myself to a narration of facts. These latter, if I mistake not, tell in a candid way of a district of marvelous promise that has been developed into something more than a promise—into a reality. It would be idle to say that the camp has the making of a Butte or a Leadville—nothing, in fact, is more eminently useless than predictions of mining camps. But this is certain, that neither Butte nor Leadville had, at their beginning, any such surface exposure of ore as has Monte Cristo. It was, in fact, on the strength of this surface showing that the origioal purchase nf the mines was made and all the attendant outlay begun. The purchase was made on the report of Mr. A. L. Dickerman, a mining expert of wide repute, and his judgment has been backed up by subsequent development done. All the work of the year has confirmed and emphasized the promise of the beginning. As the veins have been explored, the ore bodies have shown a tendency to increase in size and the ore in value. If any mining camp ever had an assured and certain future, Monte Cristo must be set down as one of sucb.

There are roundabout Monte Cristo a number of other districts of fine if not of equal promise. Eight miles to the southeast lies the Troublesome; six miles south is that of Silver Creek; ten miles southwest the Sultan; eigbt and twelve miles west Crystal Creek and Silver Gulch and the Stillaguamish. All of these will be reached by, or be accessible from, tbe Everett and Monte Cristo or the Great Northern, both of which roads are now nearing completion. Both roads center at Everett, affording cheap and short transportation to the smelter. The latter is rapidly becoming the center of the mining activity of the region. Capital, which has hitherto been shy and backward, is now beginning to flow into the region, and the indications are that the immense mineral resources of western Washington will speedily find tbe development they have long awaited.

CARL SNYDER.

Simplicity of the Cyanide Process.

LOS ANGELES, CAL., Dec. 10, 1892.

TO THE EDITOR:—It seems to me that the merit of the cyanide process lies as much in its simplicity as in its efficiency. It does not require any argument to prove that the more complicated a process is, the less its commercial value. As it now stands, the process certainly is simplicity itself, consequently any proposed improvement must not only be *an improvement*, but must be of sufficient advantage to compensate for increased complications and difficulty of manipulation.

Let us examine that portion of the process which apparently offers the greatest field for improvement, namely, the precipitation. The solution contains the dissolved gold in the form of a double cyanide of gold and potassium, together with the silver and perhaps a very little of the base metal. For all practical purposes, however, the latter may generally be disregarded after it has found its way into the solution This solution is passed through a filter of zinc shavings and the gold is precipitated upon the zinc. The precipitation consists of a simple replacement of gold or other metals in solution by zinc. The precipitate, when dried, is ready for sale to the refiner. When desired, it can be melted with a flux of sand, borax and bicarbonate of soda and run into bullion at the works.

The objections to this method of precipitation most generally advanced are that the grade of the bullion is lowered and tbat the strength of the cyanide solution is reduced by contact with the zinc.

As to the first objection; from a metallurgical point of view it certainly is desirable to obtain as nearly a finished product as possible, but from a practical standpoint I can really see no difference whether we dispose of an ounce of bullion .666 fine for $13 75, or .78 of an ounce .850 fine for the same sum, provided that the cost of production is the same in both cases.

The second objection to the use of zinc as a precipitating agent appears to be equally without foundation. It has been shown tbat the value of the cyanide consumed is often as low as 75 cents per ton of ore treated. Of this amount a very small per cent is actually required to dissolve the gold, the balance being wasted in other reactions before it reaches the zinc. This wasting may occur from a number of causes, the most prominent being a considerable amount of base metals in the pulp under treatment; undue exposure to light and air, or a degree of acidity of the pulp too slight to be readily noticed. But whatever the cause, tbe loss will be found to occur in the ore-tank, or at least before the zinc is reached.

When the filter is in proper condition and the time required for precipitation has been determined, it will be found that the actual loss in the strength of the solution in the zinc-box is too slight to be determined by the ordinary tests; it is certainly less than five cents per ton of ore treated. Surely, this is not a very promising field for improvement, especially when the extreme simplicity of the present means is considered. That zinc will precipitate the gold completely cannot be questioned. I have repeatedly failed to find over a trace of gold in a solution which was passed through a filter in proper condition.

Allowing that it costs five cents per ton of ore treated for zinc (which appears excessive), and tbat a loss of five cents per ton also occurs in the strength of the cyanide solution during the process of filtering, it gives a cost of but 10 cents per ton, whicb certainly leaves little to be desired in this direction.

It is more than probable that the present cost of potassium cyanide will he materially reduced. Zinc is cheap enough already. The cyanide process has come to stay, and what is more, the only improvements that are likely to be made in it for some time to come will be in tbe manipulation. It may take an expert chemist in many cases to determine the condition of working, but once these are established, any one of average intelligence can conduct the operation as long as the nature of the ore being treated undergoes no marked change.

There is a mistaken notion current that the cyanide process is a rival of amalgamation. Such, however, is not the case. Each covers a field that the other cannot profitably enter. It is the exception to find an ore that can be treated with equal advantage by either process, although both will frequently be found beneficial. The cyanide process, in taking its place in the front rank of the metallurgy of gold, displaces no one, antagonizes no one; it simply fills a gap that has long been open.

FRANK ALDERMAN GARBUTT.

Mechanical Progress.

Blue Printing.

The usual process of making blue prints is to coat one side of the paper, using for the purpose a brush or a sponge, with a mixture consisting of one drachm of the red prussiate, and one and one-half drachms of the ammonia citrate of iron, dissolved in about one ounce of water. This amount of solution will be sufficient to coat several large sheets of paper, but it will not keep a great while after being coated. The surface is yellow when first coated, and after a week or so will have turned to a dirty greenish color. It can be used in this condition, but makes inferior prints. It is better to make up some fresh solution, for it only takes a few minutes to dry the paper ready for use after the coating has been spread on. Then a sheet of it is put under the tracing, and exposed to sunlight under a sheet of thick glass, or in a regular frame for making blue prints. After exposing until the parts of the paper not protected from the sunlight have turned to a kind of "greenish granite" color, the print is removed and washed in clear water until the yellow color stops coming from it. Then the print is hung up to dry.

In order to make a blue print with blue lines on a white ground, two methods are open. The first is to make a print which may be called a "negative," and then to make the blue-line prints from that instead of from the drawing itself. The reader can readily see that if a print from a transparent sheet, with opaque lines thereon, will give a copy that is opaque with transparent lines, then by taking another print from the first print there will be opaque lines on a transparent ground again, similar to the original drawing. But there is one drawback to this method which is fatal to its success. That is, the blue print which is made from the original will not work when used as a negative, because, being of a blue color, the rays of light which shine through the color will affect the sensitive sheet fully as quickly as the rays which shine through the transparent or white paper. In fact blue is one of the actinic colors, and likewise one of the most actively actinic of them all. Now, if the print taken for a negative could be black, yellow, red, or any of the nonactinic colors, there would be no more trouble in printing a blue print from it than there is in printing one from the original tracing.

It is in order, therefore, to look around for some means of making a print which will be nonactinic. To this end, it is best to get a sheet of "silver paper" from a photographer, or, what is easier, get him to make a print of the tracing on silver paper. Then, after it is "toned" and finished, it can be used as a negative for the making of as many blue-line prints as may be desired. The other way of making a blue-line print, or, in fact, one other way, is to make up a kind of blue-print paper which will turn blue only where the sunlight does not hit it. This is a little different from the first kind of paper described, and the difference is that this kind is charged with chemicals which the sunlight has the power of destroying the color thereof, instead of setting the color, as in the case of the ordinary blue paper already described. For the present it will be sufficient to state that the paper is prepared by mixing together three solutions, then mixing the three into one when ready for use, and spreading it on the paper as if for a simple blue print. The three solutions are: Gum arabic six drachms, water 30 drachms; ammonia citrate of iron four drachms, water eight drachms; perchloride of iron 2 5 drachms, water five drachms. As these things will keep separate, they can be mixed in larger quantities; for instance, taking ounces for drachms; then the quantity that is to be used at one time can be taken of each, let it be in drachms, half-drachms or minims. The paper will also keep well after it is sensitized, so that a quantity may be made up at one time and kept from the light till needed. The reason that this kind of paper will keep, while the other will not, is because the common paper turns upon exposure to the light, while this kind will not turn, even in the developing solution, if exposed to the light. The paper is printed in the usual manner, then it is floated upside down on a solution of potassium ferrocyanide, one ounce; water, four ounces.

The paper must be floated on top of the mixture, because it will stain the back of the print if any of it gets thereon. After the lines get blue enough, as may be determined by turning up a corner of the paper occasionally, it should be removed from the "developer" and floated on clean water, which will at once stop the process of turning any darker. If there be any blue spots left on the paper where they don't belong, *i. e.*, except on the lines, they can all be cleared off by putting the sheet of paper in (no need to bother with putting on top this time) a solution of eight parts muriatic, three parts sulphuric acid, with 100 parts of water. After the blue spots have disappeared, wash well in water, dry, and a print with rich blue lines on a white ground is the result. This kind of a print, the "blue positive," may be colored; something which cannot be done with an ordinary blue print.—The Tradesman.

Loss of Heat from Boiler Scale

It has been held by many that one-eighth inch scale in a boiler causes a loss in fuel of 28 per cent. It will be interesting to read what E. M. Herr, superintendent of the Grant Locomotive Works, says in the *Railway Master Mechanic:* "In some recent tests made on a prominent western road," he says, "the average temperature in the smoke-box of two locomotives was measured under as nearly similar condition of operation as possible, the only difference being that the boiler of one engine was clean and free from scale, while that of the other so badly scaled as to necessitate stopping it for removal of flues and the cleaning of the boiler. The pyrometer averaged but 25° higher in the dirty than in the clean boiler, with an average temperature of about 550°. This test is corroborated by similar tests on another road coming under my personal observation. A comparison of the fuel record of engines from each of whose boilers as much as 4000 pounds of scale and mud was removed, also discloses no such great loss in fuel economy as this paper would indicate, but, on the contrary, shows no more than 4 or 5 per cent loss which the pyrometer tests give. These boilers were covered with a combined sulphate and carbonate of lime scale, averaging certainly upward of one-eighth inch in thickness.

"The bad effect of scale upon the life of boiler-sheets and flues is unquestionable, and rather under than overstated in the paper. That a large saving in boiler repairs and all the attendant expense and loss of revenue from unserviceableness of the engine can be made by keeping the boilers free from scale has often been shown, and it is here, rather than in an extensive gain in the fuel record, that the economy and advantage of clean locomotive boilers is to be looked for."

Silk from Wood Pulp.

United States Consul Francis B. Loomis, at St. Etienne, in a report to his Government, gives some interesting facts regarding the proposed manufacture of silk from wood pulp. It appears that the reported failure of the silk crop or output in France, Italy and Syria has again directed the attention of some of the most important manufacturers of St. Etienne to the process invented by Count Chardonner for the manufacture of silk from wood pulp by a method similar in principle to that employed for converting wood into paper. A few years ago the new invention was exploited, and the rights to its exclusive use were sold to companies in Germany, France and England. Large works were built at Besancon, and preparations for manufacturing silk from wood were projected and made on a somewhat extravagant scale. Some remarkable specimens of silk made by this process were shown, but it was found that the fabric so manufactured could not be woven successfully in large pieces, and that it was of so highly inflammable a nature as to be a source of great danger. The experiments were then dropped, and nothing was heard of the matter until a few months ago, when a company was organized to develop the process of Count Chardonner and make it a thoroughly practical one.

This company is quietly at work now, and is making a large number of experiments, which, Mr. Loomis is informed by those in a position to know, are likely to lead to some important and satisfactory results. It is believed that in a short time the company will be able to offer to the trade a substitute for silk which will possess all the essential qualities of silk, and which can be sold for less than half the cost of the genuine article. This company has secured the revision to itself of the exclusive rights to the process, which had been sold, and if its experiments meet with the success that is anticipated, it will be in a position to make its own terms on every side. Consul Loomis has secured interesting samples of ribbons made from wood pulp or cellulose silk, which he sent with his report to the department. Up to the present moment these experiments are more interesting than important, and the silkworm rests secure in its work and its career, but nobody can tell at this early stage of development the wonderful things that the future has in store for wood pulp.

Scientific Progress.

Misuse of Quinine.

In an article in *Science*, Dr. W. Thornton Parker says:

Few, if any medicines, enter so largely and generally into popular use as quinine. Throughout the world we find it almost everywhere for sale; it can be purchased in any quantity by anybody, and used as the the purchaser may think best, in larger or smaller doses, at intervals, or continually. Few seem to understand its poisonous action, or even suspect that its continual use can result in any special injury to the system. It is prescribed by all sorts and conditions of men, women and children. Ruse, in his excellent text-book of medical jurisprudence, defines a poison as "a substance which, when introduced into the body by swallowing or by any other method, occasions disease or death; and this is an ordinary result in a state of health, and not by a mechanical action. It must be as an ordinary result; a substance, for example, which affects one person injuriously through idiosyncrasy, is not to be called poison. Again, it must be *in the healthy system*, as is well known, many diseases render the system extremely susceptible to impressions by external agents, e. g., in gastritis, the blandest substance, even water, may excite vomiting."

The action of the malarial poison upon the system is of such a nature that many would claim that any abnormal nervous impression would be more likely to have its origin in the malarial poison than in the quinine, which is given with a view to neutralizing that poison. We know of so many diseases following the inception of the malarial germs that any attack upon quinine, as a poisonous remedy, may reasonably expect prompt resentment. Ringer states, that "large doses produce severe frontal headache with dull, heavy, tensive, and sometimes agonizing pains." While these symptoms last, and, indeed, generally before they appear, the face is flushed, the eyes suffused, and the expression is dull and stupid. Even small doses in persons very susceptible to the action of this medicine will produce some of the foregoing symptoms, especially the headache and mental disturbance. Many of these symptoms are, no doubt, due to the action of quinia on the brain. In toxic doses it excites convulsions.

"Cbirone and Curc find that the removal of the motor centers of the brain prevents these convulsions; and, if the central hemisphere is removed on one side, the convulsions are unilateral. Albertoni, on the other hand, finds that quinia will induce convulsions when the central hemisphere or the cortical motor centers are removed." Dr. Bartholow states, that "In full medicinal doses, as the quinia accumulates in the brain, a sense of fullness in the head, constriction of the forehead, *tinnitus aurium*, more or less giddiness, even decided vertigo, may be produced. In actually toxic doses all of the above symptoms have been intensified. There are intense headache with constriction of the forehead, dimness of vision, or complete blindness. deafness, delirium, or coma, dilated pupils, weak, fluttering pulse, irregular and shallow respiration, convulsions, and finally collapse and death." Dr. Wood states, that "The minimum fatal dose of quinine is not known, but it must be large, and probably varies very much." Brown-Sequard states, that "In epileptics the attacks are rendered decidedly more frequent by the cinchona alkaloids." Dr. Wood is of the opinion, also, that "In large doses quinia, without doubt, abolishes the functions of the cerebrum."

From the foregoing we have evidence to demonstrate that quinia is too dangerous a remedy to be prescribed recklessly by medical men, and that its popular use by people ignorant of its action should be condemned and, if possible, prevented.

THE MANUFACTURE OF LENSES.—In the city of Munich is one of the most celebrated lens manufactories in the world, its wonderful products being in demand in all the countries of Europe. The perfection characterizing these lenses is due to the unvarying precision and faultlessness of work applied to every object produced before it is permitted to leave the Steinheil establishment. The lenses, after being roughed out in cast-iron molds by hand, are ground fine by means of emery powder and water in glass molds, each workman being provided with a glass model of the surface to be imparted to the lens (such surface in all cases being spherical,) and each is tested to see that it has received its proper curvature by means of a so-called spherometer. The different operations of grinding, finishing, polishing, centring, etc., are all performed by separate workmen, who are practiced in one of these particular branches only.

NEW PIPETTES FOR MEASURING LIQUIDS.—A new pipette for measuring volumes of liquids has been brought out by M. Roy before the Societe Industrielle, of Rouen. Every one who uses the ordinary form of pipette knows how difficult it is to obtain the exact volume of fluid, and it is to overcome this difficulty that M. Roy's new pipette has been designed. It is made in two parts; one, the portion to contain the measured volume of liquid, being made of the same shape as the old pipette, but made only large enough to hold the required quantity. (If an ordinary pipette be taken, and the stem be cut off at the mark, this portion of M. Roy's pipette will be obtained.) The second portion, which is the novel feature of the instrument, consists of a glass tube with a wide cylinder blown on the end; this cylinder fits over the bulb of the pipette, a tight joint being made by grinding the two contact surfaces; a piece of rubber-tubing with a pinchcock and a finger-hole in the side of the covering cylinder completes the new instrument. It is used by placing the finger over the side hole, inserting the end of the burette in the liquid of which a known quantity is to be measured, then drawing with the mouth at the other end in the usual way, until the fluid flows over the end of the measuring portion into the cylindrical cover; the pinchcock is then closed, the pipette placed in the vessel into which the liquid has to be delivered, and air admitted through the fingerhole in the side, when the liquid in the pipette flows out.

A PLAN to light by electricity the tracks of the Pennsylvania railroad between Broad street station and Bryn Mawr, on the main line, and between Frankfort and Broad street, on the New York division, is under consideration, says the Philadelphia *Record*. If the project materializes, there will practically be no further use for headlights on the locomotives running between these points, and should the line of electric lights be continued all the way to New York, which is neither impractical nor improbable, the entire roadway will be as light as day at all times, rendering headlights absolutely useless. The company is now constructing a mammoth electric light plant at Sixteenth and Filbert streets, which would afford ample facilities for an extensive circuit of lights if established, and there is enough land adjoining now in the possession of the company to admit of extensive additions should they be needed. General Agent Latta states that the matter has been talked of for some time, but that nothing definite has been done in the matter.

QUANTITATIVE DETERMINATION OF LEAD.—In operating galenas, Herr Ludwig Medicus adops the following method: After converting the lead into a chloride, he dissolves the lead chloride in potass-lye, and passes a current of carbonic acid through the solution for two hours. The precipitated carbonate is filtered off, washed, dissolved in nitric acid, and the lead is precipitated electrolytically as peroxide. He attempted also to precipitate the lead from the alkaline solution as peroxide by means of bromine. He succeded best in the following manner: The chloride is dissolved in potass-lye; the solution is poured into a flask closed by a cork, with two perforations for the introduction and the escape of gas. A slow current of gaseous bromine is passed through the entrance tube above the liquid, which is gently heated. The bromine is readily absorbed, and the lead is gradually deposited as peroxide. The filtration is best effected by exhaustion through finely elutriated asbestos placed between two discs of asbestos paper.

A RAIN GAUGE.—A recent suggestion for the construction of a rain-gauge is that the copper body should be deeply corrugated so that the contained water may be permitted to freeze solid without incurring the risk of fracturing the vessel. It is thought that if the lower part of the rain-gauge were kept immersed in a freezing mixture with the object of solidifying the rain-water as collected, the risks of error due to irregularities in the rate of evaporation would be greatly reduced. For the purpose of measurement the ice would be thawed in a warm room, and the volume of the resulting water would be measured at the temperature of maximum density.

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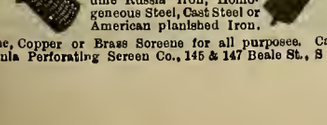

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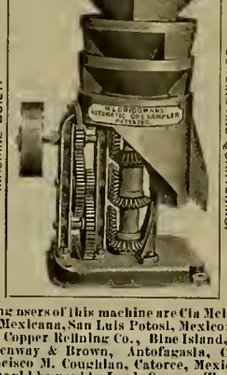

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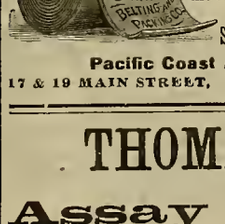

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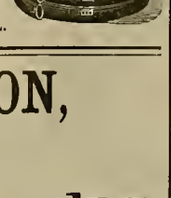

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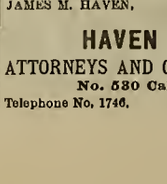

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Electricity.

Electrical Railways in Small Towns.

The stupendous growth of the modern street railway is nften pointed nut, so nften in fact that investors are beginning tn fear that tbe business nf organizing companies for the purpose of building electric railways is almost being overdone. Nothing can be more important, in deciding beforehand the desirability of a street railway in a certain town, than a knowledge of about what proportion of that population is likely to be regular patrons of the intended road and how many passengers are needed per annum to make the investment pay.

The commercial benefits that a new street railway bring to a growing town are so well known as not to need mention, and the practical aspect settles itself into tbe question as to how small a town would be profited by the building of a street railway. In treating this it is necessary to know just wbat part of the population is likely to ride daily. The following figures, which have been carefully prepared, will show what past experience has proved. The average of nine towns with a population ranging from 3500 to 18,000 shows that each person takes on an average 29 rides per annum. It bas been estimated by such able engineers as Mr. Crosby that, in order to pay five per cent on the investment, an electric car must earn an average of 15 cents per car-mile. At a fair rate of paying expenses tbis would require about three or four passengers per mile. With the low average of 110 miles per car per day about 400 passengers would tbus be needed to make the road pay. If a population of a certain town be 12,000, according to the above figures 348,000 fares would be collected per annum, and this would support no more than two cars regularly. By the same average, a population of 20,000 would support three cars in such a way as to earn five per cent on the capital invested; the calculation including cost of building and equipping a new power station. Nearly every town that would be included in the above list already has an electric lighting station, and almost always has two or three streets that would yield a heavy traffic; thus a plant already in operation would strike off from the expenses of the above estimate the cost of powerhouse and nearly all its effects, with the exception of generating equipments and possible increase in boiler and steam plant. There are in the United States more tban 250 towns with a population ranging from 8000 to 20,000, a very small fraction of which have a street railway installation. It is not to be wondered at, then, that the present electric lighting equipments are made use of by investers seeking a profitable return. We think the hue and cry that trolley roads are becoming overestimated would be less frequently heard if all of the advantages which street railways bring with them were also taken into account.—Street Railway Gazette.

The Electrical Habits of Iron.

It is strange how little is known about the loss of power in iron under reversals of magnetization. It has been known for many years that energy was lost when iron was magnetized and demagnetized, but, says London *Industries*, tbe builders of dynamos had no clear idea on the subject. Seven years ago Professor Ewing and Dr. Hopkinson called attention to the loss of energy by hysteresis, apart from Foucault currents; but since then no information of any practical importance has been added. It seems as if everything connected with alternating currents is doomed to go through a period of barren quasi-scientific treatment before being studied and utilized by electrical engineers. The quasi-scientific metbod of treating iron is to take curves with a ballistic galvanometer. This is a cumbrous method, and does not give the information required. The engineer really wants to know what kind of iron gives least loss by hysteresis, what maximum induction does it pay best to employ, and how much energy is wasted per cubic centimeter per cycle. To test a given sample the obvious way is to make a little choking coil of it, and to measure the power lost by a wattmeter. This gives the information at once as regards that sample. If readings are taken at different electromotive forces, the losses at different inductions are obtained. The ballistic galvanometer method is merely an indirect and perbaps inaccurate way of arriving at the same result. Finding the qualities of different samples is a very small matter. The cbief difficulty is to find good qualities of iron at reasonable prices, and what is wanted is the knowledge of the causes that go to make irnn and mild steel good or bad. Makers of iron do not generally know anything about hysteresis, and electricians knnw little abnut irnn, but it is nn use shirking the subject and reading papers tn scientific societies about curves belonging tn specimens nbtained at randnm from unknown sources. Reams nf paper have been covered with researches on curves of random samples, and they are absolutely useless. They may be nf scientific interest; if so, well and good, but they are generally supposed to be for the benefit of the benighted and ungrateful practical man. So far all the information the dynamo maker has is that soft iron has comparatively little loss by hysteresis, and he pins his faith on some particular merchant who supplies him with a metal which he calls "hest Swedish charcoal iron," but wbich is not generally labeled "Made in Sweden."

A few investigators have given the analyses of their samples; but we do not know whether the percentage of carbon is the salient quality, or whether the mioute traces of other substances increase or decrease the loss of power. Neither do we know how the treatment of the iron in rolling and annealing affects the magnetic properties. If investigators could only be induced to consider what practical people want to know, instead of what "looks deep in print," some useful information might be obtained.

Electricity in Mill Work.

We are now really entering upon the electric-power transmission era. Recent developments clearly show this. Electric-power for millwork has long been talked of, but its realization and adoption now seem to be at band. Its practicability and economy have before been demonstrated, but the drawback has been the cost of the apparatus. The advantage of subdividing the units of power in mill and factory by the use of electricity is a virtue of the system which will commend itself in place of steam, providing the first cost of apparatus is not too great. It is estimated it saves 30 per cent in power over the present steam methods, with its attending long lines of belting and shafting.

The high cost of the apparatns necessary for power purposes has been due more to oversight than necessity. Machines heretofore have not been made for this special work, but now, as an extensive and profitable field and one neglected in the past appears, special machinery of reasonable cost for this purpose is being made. We have it from an authoritative source that within 60 days the price of electric apparatus for power purposes will be materially reduced, and important developments may be expected to follow.

New England, as it rightly should, with its great mill and factory interests, is taking the lead just now in the adoption of electricity for power transmission. The Cataract Construction Company of Niagara Falls, of course, will be without exception the largest power-plant in the world, but it will supply current for all purposes. The Taftville equipment, wbich will be strictly a mill plant, will in all have a capacity of 750-hnrse power in generators, aod transmit power from waterfalls 3½ miles distant. This will operate a large part of the mill machinery. In locations where waterpower is cheap and relatively handy, it can, through the agency of electricity, be made to run machinery cheaper than by any other method.

We predict that in a few years all good waterpowers in New England and elsewhere that are now ruoning to waste will be harnessed by electricity to operate the wheels of industry. The fact, however, that electricity can be subdivided, and therefore do away with considerable shafting and belting, often recommends its use even where steam has to be used to operate the generators. This has been demonstrated in both Brockton and Lynn. In the latter place it is proposed to equip about 12 factories with electric-power throughout, the current to be furnished by tbe local central station.

Such plants will need but little attention, and with its numerous motors operating independent of each other, power can be used as wanted. The supply of power will be regular and reliable, a duplication of generators being in readiness at the station from which power is taken.—Boston Commercial Bulletin.

Electric Light and Gas.

Engineering, in a "note" oo this subject, remarks that the erection of numerous large electric central stations has naturally brought the respective merits of gas and electricity for lighting purposes to the fore, as well as the question of what effect the increased adoption of the latter is likely to have upon the consumption of the former. As a rule, hnwever, tbe consumption of gas is steadily increasing, nntwithstanding the mnre general adoption of electric light. In Stockholm, for instance, the increase in the consumptinn of gas in the year 1888, when 14,000 incandescent, and about 250 arc lamps were in use, amounted to mnre than 6½ per cen., a state of affairs which still exists, althnugh electric light has in tbe meantime become much more general. In Berlin, where the central statinn alone feeds some 100,000 lamps, in addition to numerous private installations, the increase in the consumption of gas has in late years been steady. During the financial year 1888–89, for instance, the private consumption of gas rose 7½ per cent, althougb the number of electric lamps was doubled during tbe same period, a fact which becomes still more remarkable when it is pointed out that the increase in the gas consumption was largest (about 10 per cent) in the central parts of town, which were nearest to the electric installations. Under tbese circumstances the corporation of Berlin decided to build a fifth gas works, calculated for a maximum production of not less than 12,400,000 cubic feet per day. At about the same time Hamburg expended $750,000 in the extension of one of its gas works, although at the same time an electric central station for 20,000 lamps was being built. In Leipsic the old gas works have been extended and the new ones doubled, simultaneously with the erection of several important electric installations. At Elberfeld, a maoufacturing town of a little more than 100,000 inhabitants, the consumption of gas is increasing, although there is a central electric station of 7000 lamps capacity. The same is the case at Muhlhausen. At Darmstadt, with only 50,000 inhabitants, the gas works are taxed to tbe utmost of their capacity; an electric central station for 4000 lamps was, therefore, built, but the gas works have since had to be extended. At Lubeck there was, to begin with, a decline in the consumption of gas after the central electric station of 2600 lamps had begun operations, but this did not continue for more than a year, and since then the consumption of gas has been steadily increasing. In Gothenburg electric light has been adopted to an unusual extent, and is constantly increasing, but still the consumption of gas becomes larger every year, and a new gas works has been built. Of course it is improbable that a continued increase of electric-lighting will also for the future be attended by a larger consumption of gas, yet there is no reason to anticipate any marked decadence as far as gas is concerned; for along with its original use for lighting purposes, gas is every day applied more and more to heating and industrial purposes.

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Notice is hereby given that at a meeting of the Board of Trustees, held on the 22d day of November 1892, an assessment (No. 70) of Twenty-five cents (25c) per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the TWENTY-EIGHTH DAY OF DECEMBER, 1892, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 20th day of January, 1893, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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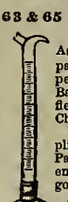
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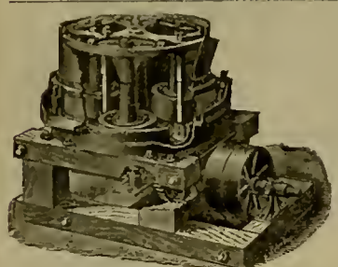

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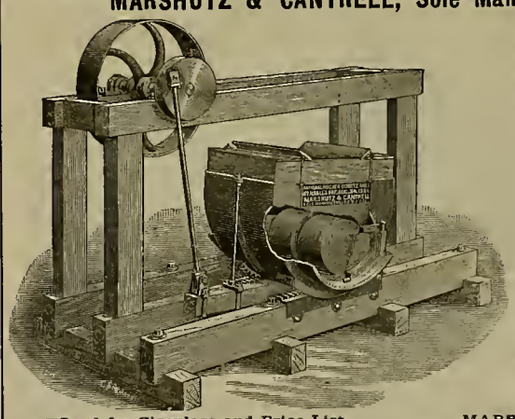

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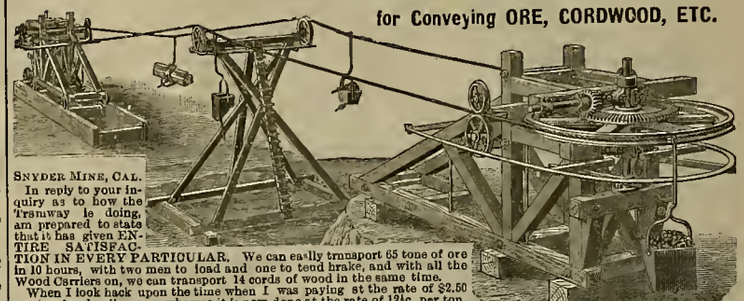

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Useful Information.

The Proper Method of Firing.

Mr. James Sargent, inventor of the automatic smoke-preventer, writes: The average steam boiler furnace wastes a large amount of coal by reason chiefly of improper firing, and while it is beyond the limits of a treatise of this character to give full directions covering every case, the following will, if followed, be of value to every user of soft coal.

In the first place, firing is hard work, and the tendency of the average fireman is to feed in too much coal at one time, the evident intention being to thereby increase the length of time between fresh fires. The outcome of this is, that for a short period after each application of fresh coal, what may be termed the natural smoke-consuming capacity of the furnace is overtaxed, with the result that a considerable portion of the distilled hydrocarbons is unconsumed, and hence passes off as smoke. Moreover, this loss of hydrocarbon is accompanied by that form of incomplete combustion which produces carbon oxide instead of carbonic acid, with a consequent great loss of heat.

The clear remedy is more frequent firing with smaller quantities of coal to each fire.

Again, even when the amount of coal added at each firing is not too great, the tendency frequently is to wait until the fire has so far burned out as to become lower than is compatible with the conditions for perfect combustion. In this case, the adding of fresh fuel results the same as before, namely, in the distillation of heavy hydrocarbons, which pass away as smoke.

In a few words, we may say, then, that more frequent firing, with smaller quantities of fuel, will lead to considerably better results than are gained by the usual method. Firing alone, however, even though carefully conducted, cannot be relied upon to prevent smoke emission, although when joined with the use of Sargent's automatic appliance, a practically smokeless combustion easily ensues. As further useful hints, we may say:

1. The fire should be evenly distributed over the entire surface of the grate, and not heaped up in front, with the grate nearly uncovered at the bridge-wall, as is sometimes the case. Leaving the grate uncovered at the rear end of the firebox permits the admission of cold air at a point where it can only do harm.

2. Large pieces of coal should be broken into small lumps, and in firing distributed evenly over the entire area of the fire, or better, over the front half of the firebox, and pushed back as combustion proceeds at the rear. In this way the rear half of the firebox is supplied only with coked fuel from which the constituents of smoke have always been fully driven off.

3. The opening of the furnace door admits too much cold air, hence, as a rule, firing must be done quickly, keeping the furnace door open as short a time as possible.

4. Ash-pits should be frequently cleaned, and the air-spaces between the gratebars kept free.

The only objection that can be urged against the foregoing brief hints is that they increase somewhat the labor of firing. A strict compliance with them will by itself decrease fuel consumption at least five per cent. Their rigid use in conjunction with the automatic smoke appliance will decrease fuel consumption for a given amount of work to be done from 10 to 15 per cent.

Music for the Phonograph.

All day long the sounds of music issue from the rear windows of the central house in the block on the east side of Fifth avenue, between Twenty-eighth and Twenty-ninth streets, says the New York *Sun*. These sounds are not such as come from the piano when the latter is under the spell of my lady's fingers, or from the guitar or violin or any other instrument that is appropriate to individual entertainment. They are of different kinds, both vocal and instrumental. Sometimes they emanate from a chorus, sometimes from two voices only, and sometimes from one. Brass bands and string orchestras contribute. The sounds are always very loud and can be heard for blocks around. Sometimes the music is accompanied by oratory. The people who occupy the houses on the same block, and also those in the houses which form the square to the eastward, can hear all plainly. The sounds affect these people variously. Some seem to be much annoyed and keep their windows closed most of the time. Others seem to enjoy it, and sit at open windows or even go out into the rear yards to hear more plainly. The servants seem to enjoy it particularly, and probably many a household duty is neglected while they stop to listen. If one were to enter the house whence the noises come, he would find that the music and oratory are all due to Mr. Edison's invention of the phonograph, and the sounds are intended to be recorded indelibly upon the little wax rolls contained in phonographic instruments. The popular songs, oratioos of great speakers, and all the other entertaining and instructive sounds which are duplicated on the phonograph, originate here. The company which puts the phonographs in the hotels and other public places throughout the country must constantly provide new rolls containing the latest instrumental music, songs and speeches, and, therefore, musicians and orators are kept busy every day introducing them into the machine.

Artificial Eyes.

The *Optician* says: The porcelain eye, by its truly wonderful likeness to the human eye in color, size and conformation, is a mark of the advance in opthalmological science. If the removal of eyes in olden time was done in a rude way, as by putting lime between the eyelids, or puncturing the ball with a nail, no less primitive in its way was the artificial reproduction of the eye. The first artificial eye consisted simply of a metal shell painted or enameled over, figuring the sclerotic and iris and leaving the cornea absent. It was not until the seventeenth century that a Dutchman made an artificial eye of enamel, and combining this with glass, succeeded in representing the cornea. However, the eyes were simple oval shells, like the half of a bird's egg, and could be worn in either orbit, there being no right or left. How different now! Not only have we rights and lefts, but the resemblance to the natural eye is so great that it often takes an expert to detect it; and how completely the public in general can be deceived by it is illustrated by an incidental case occurring in the practice of the late Dr. Williams, of Cincinnati. A sharp-witted Irishman who had his eye removed by the doctor did not wish to let his neighbors know that he was wearing an artificial eye, so when he returned home he told them the old one had been taken out, scraped and put back. Not only did he deceive his neighbors, but the county papers took it up and made so much noise that the good doctor became indignant and exposed the patient's story, whereupon the Irishman, when next seeing the doctor, said: "Doctor, you see what a good thing I was making for you, and you went and spoiled it all." And the belief, says Dr. A. E. Davis, of New York, to whom we are indebted for these details, that an eye can be taken out, scraped and put back again, is not confined to the grossly ignorant, as shown by one case reported in this paper; hence it may be well to disabuse their minds upon this point before the operation is done. Artificial eyes should be removed each night, washed and kept in a dry place, and not in a glass of water during the night, as is usually done. Two years is about the limit of time of service of an artificial eye, when it becomes rough and has to be renewed. However, another medical man reports one case where a woman, for fear she would not be able to replace the eye if removed, wore it continuously, without once removing it, for 15 years.

A. FISHER, superintendent of the Caribou Water Power & Electric Company, has discovered a method of transmitting signals and sounds, dispensing with batteries and depending simply on positive and negative electrical current forces in the earth. A line is in successful operation between the company's works at the dam and the stand pipe, 7000 feet distant. He also has a branch to his home. It has been successfully tested in all kinds of weathers. The looger line has more force. By placing a key on the line it can be used as telegraph or telephone. Fisher served an apprenticeship with the electrical company in San Francisco, was sent to the Sandwich Islands and experimented there for two years. He has lived in Caribou three and a half years. He has applied for a patent on the discovery.—Columbus Press.

AN electric bicycle lamp coming into use among English wheelmen is said to give a brilliant, intense and steady light. It is about two inches in diameter. The lamp is detachable and is connected to the battery by means of a cord with a plug at the end which fits into the terminals of the cells. A switch at the bottom of the lantern enables the rider to turn the light on and off when at full speed. The accumulator is contained in a leather bag firmly secured in place by straps.

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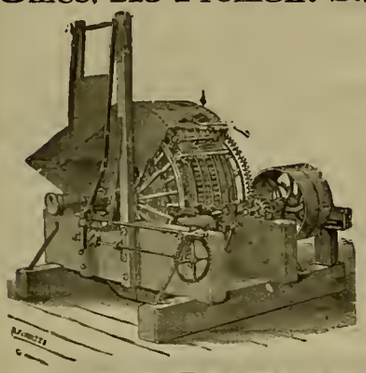

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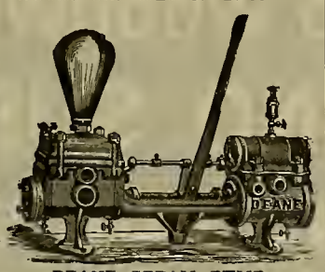

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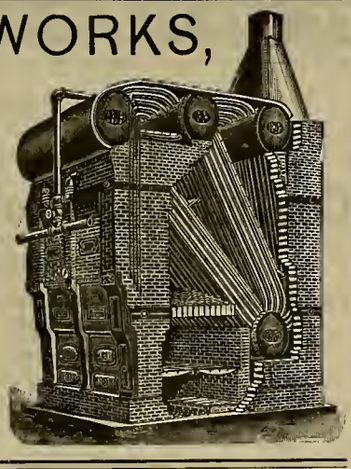

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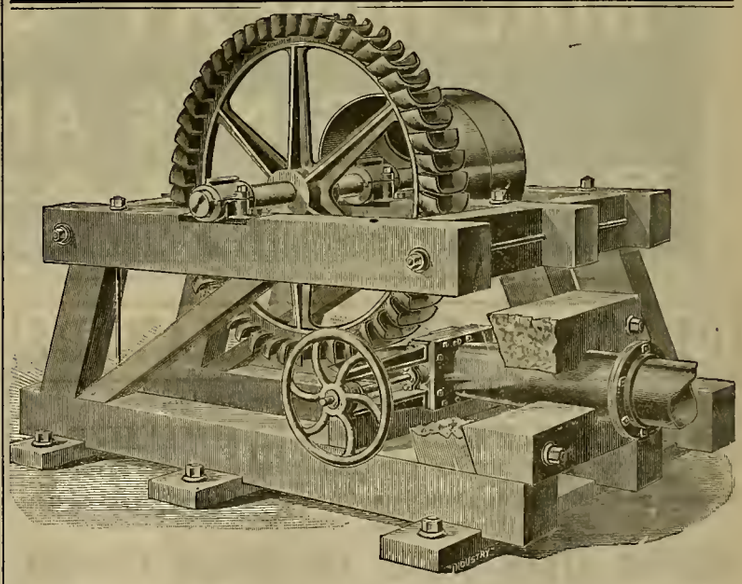

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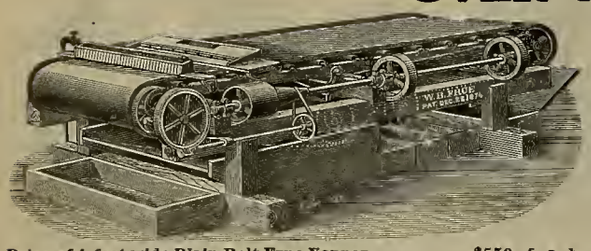

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GLADSTONE MINING COMPANY, C. J. Clark, M. E. Gen'l. Supt. FRENCH GULCH, Calaveras Co., Cal., Dec 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to mention. In order to give an idea of the work they are doing here I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

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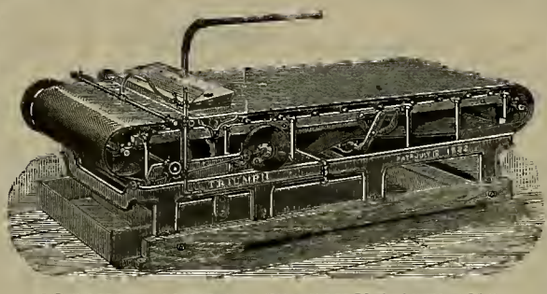

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Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Emipre Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,

Signed] Sup't North Star and Original Emipre Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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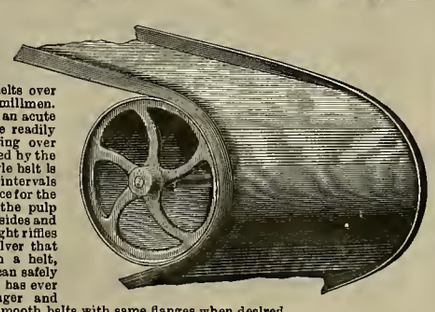

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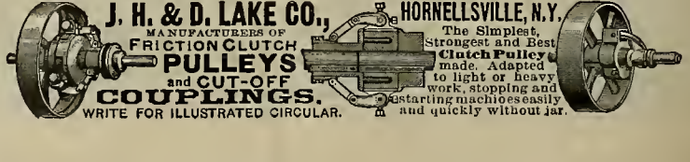

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

PIONEER DISTRICT.— Amador *Record*, Dec. 10: Charles Gracey is busy putting up two Frue concentrators at his Bryant mill. This will be a long-felt want supplied in this mining district, because hitherto only free-milling ore could be crushed to advantage. Milton Bierce reports having had to shut down temporarily the Modoc mine, awaiting machinery. F. Mace is busy hauling more machinery from Ione to the Irma Gold Mining Co. It is rumored here that Joe LeDuc has bonded his mine for $10,000 to some Stockton capitalists. Charles Stirnaman, manager of the Amador View mine, paid us a visit previous to his going to San Francisco on a business trip in the interest of his company. He reports that the mill is running full blast on $100 ore, under the superintendency of Sidney James, who has the reputation of being the most careful millman in this part of the county.

GOLD.—Amador *Ledger*, Dec. 10: Developments in the last few months in the Gover mine have opened out a large body of high-grade ore. This was found on their 800-foot level, or at a vertical depth of 800 feet. The vein is now 20 feet wide and improving as they enter into it. Although they have opened out a large reserve above their 800-foot level, the vein is richer and stronger going down, and the Gover Company intend immediately to sink for another level This development makes a bright future certain, and insures to its stockholders handsome returns for their investment. The superintendent's residence at the Kennedy is being pushed to completion as rapidly as possible, though great delay has been occasioned by the stormy weather of the last few weeks. The storm of last week worked a deal of injury to many of the water ditches, the result being that some of the enterprises of the county were without water for a time. The Kennedy ran its hoists with steam and had to shut the mill down for two days. For about a week the Zeile has been running only five stamps, while the mill has been undergoing repairs. The repairing is still in progress.

Modoc.

PROSPECTING WELL.—Adin *Argus*, Dec. 10: Dan Ambrose, who is working the Tunneling Company's mine at Hayden Hill, was in town last Saturday. He says they have the tunnel in 600 feet, and prospects are becoming flattering. All the mines being worked at the Hill are said to be prospecting fairly well.

Nevada.

WASHINGTON TOWNSHIP.—*Transcript*, Dec. 6: The mining outlook for this section is becoming brighter. Several ledges are being developed and more will be prospected and worked in the spring. The annual labor is now being done on the Miller ledge, located on Little Canyon creek, a short distance north of this place. J. R. Nickerson of Auburn is prospecting a ledge on the hillside about half a mile in a southerly direction from the Yuba mine, two men being employed. The ledge is from 8 to 12 feet in width, and some of the rock is quite rich in free gold, showing also plenty of galena and sulphurets. At the Blue Jay mine, M. A. Baugh superintendent, a contract has been recently let to drift 100 feet on the ledge each way from the bottom of the shaft, which is a hundred feet below the drain tunnel. The size of the ledge at that point is said to be from 2 to 5 feet in width and all high-grade milling ore, some of it being quite rich in free gold. The Yuba mine, owned by Messrs. Webber, Haggin and Tevis and the estate of George Hearst, deceased, all of San Francisco, has been indefinitely closed down and the pump removed from the shaft; still five or six men are yet employed by the company in extending the drain tunnel south in hopes of finding pay ore in that direction. Should their object be accomplished, the mill will be started up again. The Eagle Bird mine will in a few days close down for a short time in order to put up a new compressor, the old one being almost worn out. At the Washington mine, Alf. Tregidgo superintendent, four men are employed. Two are engaged in running a drift north from the bottom of the 400-foot level in hopes of finding a pay shoot in that direction, and the other men are doing the hoisting and keeping the mine free from water. This mine and mill have been closed down now considerably over a year. Just when the works will be started up again is of course a doubtful question. At the German mine, a short distance south of the Washington, but not adjoining properties, as has been stated, the lower tunnel is now in nearly 600 feet. M. D. Cooley is the superintendent. It is not known how wide the ledge is, as no crosscutting has been done at that point, but eight feet in width of the ledge on the foot-wall proves to be all good milling ore. It is what is generally called ribbon rock, and some of it shows gold very freely. In the upper tunnel, 227 feet almost directly above this point, the ledge is found to be about the same size in every respect, but better rock. At the present time only four men are employed in the mine. Two are engaged in extending the lower tunnel south and two are making an upraise to connect the two tunnels. When that is done, there will be ample ventilation in the mine for all working purposes, and there will be rock enough in sight to keep a 20-stamp mill running an indefinite period. A five or six-foot rotary crusher, called the Beauregard, has been erected by the company as an experiment. About 100 tons of quartz was put through. If the new crusher has not proven entirely satisfactory to the management, as it was feared it would not at the start, it has demonstrated one fact, that the rock is rich and will pay handsomely if put through a stamp-mill, with an experienced amalgamator in charge. Mr. Cooley has already purchased from the Allen foundry at Nevada City a new ten-stamp mill to take the place of the present one, and early in the spring, or sooner if the weather permits, it will be shipped to the mine and placed in position as soon thereafter as possible. This mine, as far as developed, is the most promising one in the Washington mining district.

San Diego.

A BIG GOLD MINE LEASED.—Virginia *Enterprise*, Dec. 11: The Good Hope, one of the greatest gold mines in southern California, has been bonded and leased by Denver mining men, the Waters Bros. and Wm. Weston. The mine has upward of $1,000,000 net profit in sight, and is said to have an unbroken chute of free-milling gold ore 2500 feet in length. Foreign capitalists are negotiating for the purchase of the Good Hope.

Shasta.

THE TEXAS CONSOLIDATED.—*Democrat*, Dec. 10: This mine in Old Diggins is developing right along, and the mine is run like clockwork. Mr. Hart is shipping four cars of very high-grade ore a month. The shipments average a profit of about $2000 a carload. The total output of the mine and mill is about $14,000 a month. The vein is larger and ore richer in the lower tunnels and winzes than in any other place in the mine. Mr. Hart, the superintendent, is sinking a new winze below tunnel No. 4. This winze is in an eight-foot breast of ore, and it is all high-grade ore. In No. 4 tunnel the pay chute is exposed for 500 linear feet and the end not in sight. The vertical depth of the end of this tunnel from the surface is 750 feet. Mr. Hart has broken ground on No. 5 tunnel. This tunnel will give another 100 feet of backs.

THE BULLYCHOOP PLANT.—Mr. R. G. Hart Sr. was in town Monday, having just come in from Bullychoop, and from him we obtained the following interesting items about that promising mining camp. Mr. Hart, who is superintendent of the property, has been hard at work for several months with a big force of men erecting a big reduction plant there; and had the late storm kept off for ten days, he would have had the plant completed and in fix to run this winter, but the storm blocked all the work and caused a temporary suspension of work on the plant. When he left there Saturday there was seven feet of snow on the ridge. He has erected a 20-stamp quartzmill to reduce low-grade ore, and a Dodge pulverizer to work heavy sulphurets. The Dodge mill will pulverize 60 tons of ore a day. The reduced ore from the Dodge pulverizer is conveyed into heavy steel and iron leaching-tanks, each tank having a capacity of ten tons. Cyanide process is used for leaching. The leaching-plant will handle ten tons a day. The 20-stamp mill has eight Trinmph concentrators attached, and four more will be added in the spring. The ore is conveyed to the plant, a distance of 1100 feet, by a gravitating double-track tramway conveying one-ton cars. The tramway will be roofed the entire distance to shield it from snow in winter months. It is the intention of the company to build a new mill in the near future on Jerusalem creek, one mile below the present mill, where they have waterpower sufficient to run a 100-ton plant all the year round. The tramway will be extended down the mountain to the new mill, and with this cheap power and economical way of handling the ore, the company will be able to make a profit out of $4 ore, of which there are thousands of tons on the surface on the mountain. Taking it all together, this is the largest milling plant in northern California. The company has erected quite a town on the mountain. There is a store building stocked with $4000 worth of miners' supplies, a blacksmith shop, a sawmill which has cut 207,000 feet of lumber, a large boarding-house that accommodates 50 men, an assay office with a complete laboratory, the superintendent's office and residence of seven rooms, three dwelling-houses occupied by families, six miners' cabins, a large barn, a housed water tank 12x12, besides the big mill. This one mine, when running a full force of men, will give employment to 100 men or more, and put in circulation considerable money yearly in the western part of the county.

CLOSED FOR THE WINTER.—Anderson Valley *News*, Dec. 10: The Hart mine at Bully Choop has closed down for the winter owing to the depth of snow, which is between four and five feet. T. H. Hart and son went to their Texas mine in Old Diggings district Sunday. This is a rich mine, paying the owners a handsome dividend.

Sonoma.

THE CHROME WORKS.—E. K. Stevenot, the enterprising projector of the contemplated chemical works in Sonoma, reports the local subscription list as creeping up slowly but surely. Already the people of Sonoma have subscribed liberally to the capital stock. As soon as town and valley have been closely canvassed and the requisite number of shares subscribed to give Sonoma a controlling interest in the works, the subscription list for the stock will be open to investors in San Francisco and other places until the required amount of money has been raised to start the works.

Trinity.

THE NEW RIVER MINES.—Humboldt *Standard*, Dec. 3: William Toms and George Dean arrived in Eureka this morning from New river. Mr. Toms has been sick for some time past, and comes to Eureka to spend the winter, where he can have better accommodations and medical attention. He is superintendent of the Ridgeway mine, owned by an English company. The mine has been closed down for some time past, and Mr. Toms states that he has no idea as to when work will be resumed. The mine is rich in gold and will some day, when worked pay handsome profits to its owners. Mr. Dean is in charge of the Ridgeway property at present. Mr. Toms says that the Sherwood mine, worked by Miller & Son and Thomas Nicholson, is the only mine on New river now being actively worked. Others are taking ore out of mines, but no ore is being crushed. The New river quartz is free gold-bearing with some sulphurets, but not sufficient at present to pay to save. Mr. Toms is paying considerable attention, while the Ridgeway mine is closed down, to his place on Trinity river, near the mine. He has 160 acres of mountain land adapted to fruit-growing, and he states that while he is waiting to take gold out of the earth, he will proceed to take golden fruit from the trees.

RICH GRAVEL STRIKE.—Shasta Co. *Democrat*, Dec. 10: Johnny McCall of Trinity Center is in town. He says the cement gravel channel discovered a month or so ago near Minersville is developing big pay. The gravel was found by inexperienced men, who drove a tunnel under some ground Chinamen had abandoned as worked out. The Chinamen had worked over the surface of this lead of auriferous gravel. Where the pay is the richest the gravel is a hard cement, but it carries what is termed by miners as "gourd seed gold," and will pay big worked in a mill or arrastre, or by any other device that will rapidly disintegrate the material. It is unquestionably a prehistoric river-channel deposit, and many miners believe the lead runs north and south through Trinity and Siskiyou and into southern Oregon.

Tuolumne.

TO COMMENCE.—Tuolumne *Independent*, Dec. 10: The Dead Horse mine, at Summersville, will commence active operations by the middle of next week. It has been idle for about two months for lack of water to run the machinery, and the shaft has filled up considerably in consequence. Since the pumps have been able to run, the mine is now about clear of water. The opening of this and other valuable mines in that vicinity will make times lively again.

THE MARTHA WASHINGTON.—Mr. Bennett, patentee of the Bennett amalgamator, who visited the Martha Washington mine, below Mountain Pass, to investigate the adaptability of his machine for working that class of gravel, was very much pleased with the situation in all its phases. He thinks they have a first-class layout for a mine, as good as he has seen in this or any other county. The first machine will be completed in from 30 to 60 days, and will be on the ground in early spring. They will have six of the machines, and each one will handle from 1500 to 2000 yards of gravel in 24 hours. Byron C. Hall is superintendent, and W. H. Purdie is engineer.

TO BE DEVELOPED.—Tuolumne *Independent*, Dec. 3: Messrs. J. B. Bacon, Chas. Bacon, and another gentleman of San Francisco, have taken hold of the old Joe. Hooker quartz mine, near Calder's ranch, and will proceed to develop it. The vein shows two feet in width on top, and they will sink 100 feet. If it pays as well below water level as it formerly did above, they have an exceedingly good outlook for a splendid mine. There is a five-stamp mill on the property, and the claim is in a section of old-time good mines. We wish these enterprising gentlemen all success.

MARBLE.—The Columbia Marble Mills have shipped five tons of marble to San Francisco recently. The slabs are to be used as pavements. The durability for this purpose is superior to any other marble. Thousands of tons would be in demand, where one ton is now, were there a railroad to tap this marble mountain.

NEVADA.

Washoe District.

CONS. CALIFORNIA AND VIRGINIA.—*Enterprise*, Dec. 10: Owing to the increase of gas coming from the 1500 and 1650-level old stopes on the west side of the ledge and south of the Con. Va. shaft, operations through the shaft, which is upcast or outlet for air, operations have been suspended for the past five days. The gas escapes from the stopes which were worked some years ago and are not accessible, as all the drifts and openings have partially closed from ground movement and heavy crushing. There is undoubtedly fire in some part of these old stopes, caused by friction from the ground crushing and breaking the timbers. All drifts and openings leading to points where the gas escapes on the 1650 level are being closed, leaving a small opening for the escape of gas up through the Con. Va. shaft. On the 1100 level work has been suspended. On the 1500 level have resumed work in the stopes, sending the ore through an upraise north from the shaft to the 1650 level, thence to the surface through the C. & C. shaft. There has been extracted from all parts of the mine during the week 883 1490-2000 tons of ore, which was shipped to the Morgan mill, the average value of which, per car samples, was $23.68 per ton. The average assay value of all the ore worked at that mill during the week, 980 tons, was $20.63 per ton per battery samples. Bullion shipped to the Carson Mint, assay value, $17,904.15.

OPHIR.—1465 level—The upraise started on the sill floor, on the north side of the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 feet below the sill floor of this level, has been carried up 8 feet; total length, 30 feet, continuing in porphyry and quartz of very low assay value. Bullion shipped to the Carson Mint, assay value, $5 898.48.

MEXICAN.—On the 1465 level the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 22 feet; total length, 373 feet; continuing in a porphyry formation with lines of low-grade quartz.

UTAH.—340 level—From the north drift from west crosscut No. 2, at a point 195 feet in from its mouth, west crosscut No. 3 has been started and advanced 6 feet.

SIERRA NEVADA.—The joint Sierra Nevada and Union west drift, 900 level, was advanced 20 feet; total distance west of shaft, 2708 feet; face in porphyry.

CHOLLAR.—The north drift from the east crosscut, 160 feet south of north line, 930 level, is out 37 feet; face in clay and porphyry.

POTOSI.—Extracted and sent to the mill the past week 430 tons. On hand at mill, 69 tons 1150 pounds. Average battery assays, $20.09. Average car sample assays, $21.03. Shipped to Carson Mint, 706 pounds of crude bullion.

BULLION—The north drift from west crosscut, 100 feet north of top of raise from 1300 level east crosscut, 320 feet south of north line, is out 60 feet; face in porphyry. The west crosscut, 390 feet south of north line from Ward shaft, 1800 level, is out 65 feet; face in quartz, clay and porphyry.

ALPHA.—The joint Alpha and Exchequer east crosscut on north line of Alpha is out 100 feet; face in porphyry.

WARD SHAFT.—Exchequer and Alpha joint east crosscut, on the south line of Exchequer, is out 100 feet; face in porphyry. The west crosscut, 300 feet south of Bullion north line, 1800 level, is out 55 feet; face in porphyry, clay and quartz.

NEW YORK.—The west crosscut, 55 feet north of the shaft, 800 level, is out 55 feet; face in clay and porphyry. Are extracting from the stope above the 650 level from 10 to 12 cars of ore per day, car samples assaying from $40 to $45 per ton. Commenced shipping ore to the Washoe mill on Thursday. The test run of 104 tons 1533 pounds of ore worked at the Washoe mill resulted as follows: Average car sample assays, $46; average battery assays, $39.20—producing bullion to the amount of $4,172.72.

SILVER HILL.—The north drift on the 160 level has been advanced 9 feet during the week through quartz giving low assays.

OCCIDENTAL.—Have extended the main north drift on 750 level 13 feet through low-grade ore. The upraise from south drift, 750 level, is up 22 feet; top in fair-grade ore. Crosscut No. 2 in Zadig drift, Sutro tunnel level, is in 46 feet; formation, porphyry and clay.

BEST & BELCHER.—200 level—During the past week the northwest drift has been extended 25 feet; total length, 67 feet; face in porphyry. On the 900 level we are still repairing.

GOULD & CURRY.—On the Sutro tunnel level, the joint north drift with Savage Co. has been advanced 12 feet during the past week; total length, 724 feet; face in very hard porphyry.

HALE & NORCROSS.—1800 level—Advanced No. 1 west crosscut 22 feet; total length, 214 feet; face in porphyry and stringers of quartz. West crosscut No. 3 was advanced 13 feet; total length, 153 feet; face in porphyry and stringers of quartz. During the week west crosscut No. 4 was started close to our north line and advanced 10 feet. The face of this crosscut is just cutting into quartz. Work in the face of main north drift on this level stopped; face in porphyry. West drift in the old or A-street workings advanced 21 feet and work stopped.

ANDES.—On 420 level north drift from end of east crosscut No. 1, north, advanced 6 feet; total length, 84 feet. Work in the face of this drift has been stopped. Have been making necessary repairs in north drift. To-day will start a north drift in the quartz from east drift No. 1, north.

Lynn District.

A BIG PLACER CLAIM.—Carson *Appeal*, Dec. 10: The district formerly known as the Buckeye, 20 miles south of Dayton, is now called the Lynn since it has been legally organized as a district. It is a big placer claim, and isble to cause considerable excitement in the spring. Yesterday, H. V. Benham sold a one-eighth interest in the Black Horse claim to Louis Stevenson of Reno for $300. A man who recently mined there took out over $300 in gold in two months.

ARIZONA.

STOCKTON HILL.—Kingman *Miner*, Dec. 10: George Aitken's scheme to tunnel under the mines of Stockton Hill is a good one, and would become one of the best-paying investments that could be made in Mohava county. The mines there are rich and fill the mountain in perfect network. The projected tunnel would tap all the veins at a depth of 800 to 1300 feet below the surface. The water obtained from the tunnel alone would pay back in a few years the first cost of the tunnel, while the royalties obtained from working the mines would be immense. Peter Caffrey came in from the Alpha mine yesterday and went out again this morning accompanied by R. T. Root and James Daley of Denver. Mr. Caffrey has, in the Alpha, the best mine in Arizona. It is an immense big vein and has big chutes of ore in many places. The mines on Sherum's Peak are being opened up in good shape. Tunnels are being run in and connections made with the levels above. The White Hills Co. will have a carload of mules here shortly, to be used in working their mines until their hoists can be put in place. The new manager of the White Hills mines, E. B. Kirby, is a mining engineer of experience, and will place the mines in splendid working condition in a short time.

IDAHO.

THE GEM MINE SOLD.—Wood River *Times*, Dec. 10: The Gem mine at Gem, Idaho, is practically sold. The price paid is $1,000,000, and the sale was effected on the examination and report of Mr. J. M. Burke. The purchasers are Irish landlords, who are seeking investments in reliable, well-developed mining property. For three years past the Gem mine has been one of the heaviest producers and best payers in the Coeur d'Alenes. The property is well worth the price asked and will quickly re-

place the outlay if worked on the present basis. Thns, one after another, the Cœnr d'Alene mines are changing bands at large figures, realizing to their discoverers, or tha people who have not feared to put their money in to develop them, handsome profits above a yearly income from the investment while tha money was tied up. In this case the owners have more than realized on their investment from the ontput of the property, and the sale now pending will be a clean profit. Men who bave made their money in mines ara not slow to reinvest it, which in this casa, if invested as before, would mean the purchase and davelopment ol at least half a dozen equally as expensive properlies.

THE DIAMONN FIELNS.—Special to *Examiner*, Dec. 13: After a search of two days' duration, yonr correspondent returned to Boise to-night from Owyhee county, where ha had gona to inspect the diamond fields discovered by Rnss Walters. It cannot be now doubted that diamonds have really been nnearthed somewhere along the Snake river, bnt the fields are not where Walters said they were. It was in Diamond basin, between Sinker and Rabbit creeks, that Governor Lyon, in 1865, found the stones that created such widespread excitement, aud Walters claims that his discovery was made in the same locality. This is false, however, as no location of any kind has been made in the Lyon country. The old prospect holes dug in 1865 are still visible, but no traces of other or later operation can be found. It is evident that Walters has misled every one through fear tbat he might lose his prize before he had fairly won it. He left Boise for the diamond fields last night. He was followed as far as Mountain Home, but at that place all trace of him was lost. Out of tbe hundred or more men who have gone out to locate claims not one has fonnd the diamond land. Your correspondent yesterday ran across 50 or 60 disappointed prospectors who were by twos and threes returning disconsolately from Diamond basin. They had carefully inspected tha surrounding country and said they were unable to discover any trace of Walters' bonanza, and could not learn that any strangers bad recently visited that region. Charles Van Dorne to-night admitted that the diamonds wbich Tiffany had pronounced valuable were not found near Diamond basin, but he refused to betray the location of the fields. He exhibited a message from expert Wieland, who ia now in the diggings, advising him to say nothing to reporters nntil Wieland reached Boise. W. A. Doty, of Boise, haa examined the diamonds found by Walters, and he says they are certainly genuine and of considerable value. At least 200 men are at tbe present moment eagerly seeking tbe diggings, many persons having gone to Mountain Home in the hope of striking Walters' trail. The excitement continues in Boisa, Nampa and along the Snake river, many placer miners having deserted their claims above Walters' Ferry to engage in a hunt for the precious stoues.

MONTANA.

THE PURITAN.—Philipsburg *Mail*, Dec. 10: All operations at tha Puritan mine and mill are going ahead now with results much more satisfactory than at any time since tbe mill was started np. During the recent shut-down of the mill for repairs, some needed improvements were made, with the result that it is now giving abont entire satisfaction, and the output bas already begun to increase. The hullion now being prodnced is much finer than at any time up to the time the late repairs were made. At the mina the same prosperons condition that bas beretofore been reported continues, and tbe great ore-bodies are showing more permanency and greater wealth with each day's development. Some gentlemen from the East, who are largely interested in Montana mines, were shown through the Pnritan tbis week, and after seeing it they exclaimed that it is tbe biggest thing tbey bave ever seen with a similar amount of davelopmeut. Jndging from the manner iu which the company ara going abead, they also realize the value of the mine, and from all present indications they will soon rank among the biggest prodncers of silver in the State.

UTAH.

THE GOLD PLACERS.—Special to *Examiner*, Dec. 13: The recent find of gold on the San Juan river in southern Utah, 40 miles north of the Arizona boundary, bids fair to rival any previous excitement on the continent since the days of '49. Sufficient teams cannot at present be secured to transport men and snpplies to tbe camp. From The Needles, Cal., to Gallnp, N. M., every town has been depleted of all the available outfits, wbich were used to convey goldseekers to tbe new find. Railroad men, from conductors to brakemen, have given up their positions and flocked in great numbers to the Gable district, as the new field is called. At least 1000 men are now on the grounds or pusbing across the desert as fast as teams can carry them. Winslow is almost depopulated, while Flagstaff, Williams, Kingman and Holbrook each contributed a fair share of ablebodied men. But two parties bave as yet returned, and these are refitting for their return. Tha wily original locators have staked off 147 claims and transferred 51 per cent of each claim to the Gable Mining Company. Many of the locators, who by this transfer become stockholders in the Gable Mining Company, are men holding high positions, and it is reported that not only the name of Oakes Murphy, Governor of Arizona, embellishes a location stake, but that tha name of Benjamin Harrison, too, appears on record as having transferred 51 per cent of his 20-acre location to the Gabla Company. French, a Mormon post-trader, has formed a syndicate and located 49 claims, and is preparing to do extensive work. The rocker and alnice-box seems at present the most practical method of working the claims, bnt it is said tbat in the lower conrse of the river, which is from 50 to 200 yards wide, it will require much capital to work to advantage; consequently it becomes necessary to consolidate interests. Reports vary as to the value of the dirt, but all seem to agree that it is very rich. In the meantime men are pouring in from California, Arizona, New Mexico and Utah at a rapid rate. The claims alresdy located lie in a deep canyon, soma say 2500 feet below the general surface of the country, and there is at present but one trail by which goods are packed down to tbe camp. It costs ten cents a pound to get freight hauled in, and about $35 for the privilege of riding on a lumber wagon, with the condition attacbed of walking over sand and up hills. The greater the expense, however, tha more anxions men are to go, and many walk all the way and psy $20 to bava their bedding hanled throngh. Tbe road to Blue Canyon is good, bnt the remainder abonnds in difficnlties. Everything is in preparation, and the Gable Mining Company propose spending a qnarter of a million in preliminary work before actual work in the diggings is begun. It is said the company have such confidence that they will spend two millions if necessary to place proper machinery, dams, etc., for working on a scale commensnrate with the extent and value of tbeir claims.

NEW GOLN FIELNS.—Coconino *Sun*, Dec. 5: Reports hava been rife here during the past two weeks of tba discovery of wonderfully rich placer fields on the lower San Juan river. Like all new discoveries, there is an air of mysterious secrecy about it which prevents an outsider from obtaining a true report of the discovery. That there is gold in tbe San Juan river has long been known to prospectors, but whether it exists in the quantity reported by tba parties interested in tbe claims remains yet to be proven. Tha discovery, as told to a *Sun* reporter, was mada some six months ago, and was mada by John Williams, an Indian trader living near the San Juan river. He communicated his find to other partiea and they shortly afterward commenced to work the claims, which proved to be very rich. Three months ago parties located some 200 placer claims. This attracted the attention of a few outsiders and the discovery could not longer be kept quiet. Dnring the past month prospectors have been going to tbe new find and there are now between 150 and 200 men in the fields, and they are jnst beginning to go. Last week several loads of lumber and provisions left this placa for tbe supposed new El Dorado, and from Winslow lnmber and supplies have been going for two weeks past, and at least 50 people have left that place during the past week and as many more will leave this week. Flagstaff has canght the contagion and will tbis week add to the number 50 searchers for gold. The placers are said to extend from tha mouth of the San Juan, up tbe river for a distance of 50 miles; at least locations have been made within that distance, and the claim is made that all are rich. The discovery can be reached from this point by private conveyance, and the distance is about 175 miles; the route is from tbis place to Tuba City, 110 miles; thenca to San Juan, 65 miles. There is water along the route and also good camping places, and the route crosses one corner of the Navsjo reservation. The diggings are abont the same distance from Winslow, and tha route leads directly across the Navsjo reservation, and after leaving the Little Colorado river water is scarce, and the Navajos will not permit white men to cross tbe reservation without an Indian guide. Private conveyance can be had at either Winslow or Flagstaff to the diggings. A surveyor is now at the placers and claims are being surveyed, and it is highly probable that a rush will be made to theae new gold fields.

OREGON.

A FIRST-CLASS QUARTZ MILL.—Ashland *Tidings*, Dec. 5: Probably the snuggest, tightest, best eqnipped and smootbest running quartz mill of its size in practical operation on the Pacific coast at this time is that of the Ashland Mining Company at the Helman street crossing of the S. P. Railroad in this place. The machinery was purchased of tha Joshna Handy Machine Works, San Francisco, and was pnt np by M. J. Sweeny, who was sent by the company for that purpose and who is now running the mill, in connection with Chas. J. Allmen, the assayer of tbe Ashland Mining Co. Tbe mill comprises at present one battery of five stamps, a Challenge ore feeder, a Hercules rock crusher and a Triumph concentrator. Tbe power is furnished by water from Ashland creek applied npon the turbine wheel formerly used by the planing mill. The capacity of the mill is from 10 to 15 tons ol rock in 24 hours, and this may be doubled, of course, by the addition of another five-stamp battery, which may be pnt in at any time at very slight additional expense besides cost of battery alone. The mill has heen pnt up in the most solid and substantial mannar, nnder the direction of Supt. J. A. Wilson of the mining company. Hauling ore from the mine to the mill, four teams are steadily employed, carrying abont 15 tons a day. About 100 tons are on hand under cover in the mill as a reserve run when hauling shall be interrupted by bad roads. Work at the mina continues upon the line of development mapped out by Supt. Wilson.

WASHINGTON.

MONTE CRISTO.—*Northwest Mining Review*, Dec. 1: The completion of the Monte Cristo railroad is being watched with interest by every miner in western Washington. The Monte Cristo district contains an immense body of low-grade ore that can be worked profitably when tbe road is completed. This ore will go to Everett for smelting, a large smelter being erected at the "City of Smokestacks" for this purpose. The men behind the railroad, smelter and mines are abundantly able to carry the scbeme throngh, and every one believes they have a veritable bonanza.

SMELTER.—Tacoma possesses tha only smelter in the Pacific Northwest that is running steadily. Heretofore it has been compelled to go into neighboring States for ore, but now it is redncing a large amount of ora from Washington. Within the next two years the Colvilla and Okanogan districts will be traversed by railways, and when the thonsands of now dormant mines and prospects will be in shape to tnrn out tbeir precious products, other smelters will be built, and Washington will rank with tbe best of S ates in the mineral-producing line.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Dec. 15, 1892.

Trade partakes of the usual holiday character, peculiar to the midwinter season. There does not appear to he any general disposition to push business pending stock-taking and annual settlements. While tbere does not appear to be any disposition to press trade, yet there is a feeling of confidence that after the turn of the year, or toward the spring months, there will be more activity in all branches. In this activity, it is said that the iron trade will be large sharers. Of course, this is largely dependent on the success that will he met with in securing lower local freights. The low freights hy clipper from the East have made it possible for our foundrymen and ironworkers in general to turn out work cheaper and more satisfactorily than ever before. Eastern mail advices report trade quite active for the season of the year, with the outlook more promising for general business than has obtained for years.

The local money market is reported easy, although collections on last regular collection day were smaller than for years. The small collections, taken in consideration with easy money and labor well employed, are a source of surprise and give rise to queries as to what becomes of the money earned. The banks continue to confirm reports of very little commercial paper offering. The small supply of commercial paper is said to he due to merchants carrying less goods in stock, and also to closer collections. After the holidays, heavy disbursements will he made to meet accrued interests, dividends and annual settlements. With the large sums that these call for afloat, we can reasonably look for investors seeking new business, particularly if the silver problem should he in a fair way of being adjusted on a plane acceptable to all countries in interest. Eastern mail advices report that while the money market was easier, yet the unsettled feeling regarding silver and the uncertainty regarding the probable action of the Monetary Conference were important factors in keeping banks and capitalists from entering on much new business. Doubtless the convening of Congress, with fears regarding financial legislation, had its influence also.

The proceedings of the Monetary Conference the past week appear to have been more favorable toward bimetallism, and that while no actual beneficial action can be looked for now, yet the groundwork has been laid which may lead to bimetallism before many months pass. Private advices state that the speech of Senator Jones on the question was the master effort of his life, and that it will have a telling effect in favor of himetallism. It can no longer he doubted that the calling of an International Monetary Conference, to discuss and, if possible, report favorably on bimetallism was a happy conception and that the discussion of the vexed question may eventually lead up to the adoption, by international treaties or agreement, of a plan which will bring about the long-desired double standard. A proposition was made the past week, hy one of the delegates from France, favoring the issuing of warrants hy each country against deposited silver. This plan, it is said, is acceptable to the Latin Union. Unless there is more to the proposed plan than telegraphed, it will hardly meet the approval of countries desirous of a stable currency and a larger money circulation. The issuing of warrants would make silver a greater gamble than ever, unless, as we said before, there is some provision not telegraphed which would lead to its prevention. At this writing, it looks as if the conference will soon adjourn over to meet in next spring. This, probably, would be done so as to familarize the delegates from each country with the changing opinions of their countrymen. It is asserted that bimetallism is getting very strong in both England and Germany, which, if the case, may change for the better the entire complexion of the situation.

SILVER—The steamship which left to-day for China took out some hullion. The shipments were not heavy, owing to dealers fearing to operate in the metal. The market, the past week, both at home and abroad, has hung heavily, with only slight fluctuations reported. It looks very much as if operators were in the dark and feared to operate largely either on the bull or bear side. Congressional action on the silver problem is closely watched, for there is a prevailing opinion that strong efforts will be made at this session to repeal the Sherman Act and pass a bill more favorable to silver.

QUICKSILVER—Receipts the past week aggregate 522 flasks. The market has held steady at current quotations.

BORAX—The market is reported firm in sympathy with the East,

ANTIMONY—The market is easy, with concessions obtainable. New York market is reported as follows by mail: 10¾c for Hallett's, 10¾c@11c for LX, 11@11¼c for Crown and 11½c for Cookson's in round lots.

LIME—Receipts the past week aggregate 4616 bbls. The market is steady at current quotations.

PIG LEAD—The market, while easier, is not quoted lower. The demand is slow. Eastern advices report a weak market, with producers offering freely with consumers offish.

TIN—There is very little business doing in both pig and plate. Spot parcels are hard to place, but for parcels for future delivery buyers can be found. Eastern and foreign advices are unfavorable for pig. Stocks, at last dates received, were accumulating. English cables report larger stocks of plate. There was exported from England for the United States 20,000 boxes in last month.

PIG IRON—Supplies have heen in excess of demand, and selling pressure for spot or to arrive is said to he met hy lower bids. Eastern advices report foundry and forge pig steady in all leading markets. *Iron Age* says that the East is looking forward to book a good deal of business before the close of the year. The Cramps are reported to be in the market for 20,000 tons of plates. A battleship and a cruiser are to he given out at Washington, which would call for about 3000 tons of hull plates, 600 tons of boiler plate, a round quantity of deck plates and of armor and some shapes. In New York the elevated and bridgework of the Harlem road will come up, and there are also some contracts for buildings.

COPPER—The market has held steady but firm. The stock in this country is being reduced, while the supply in Europe is the smallest on record since 1888. The favorable statistical position of the metal ought to exert itself soon, but probably fears of increased production, in the event of a bull campaign, may keep speculators out of the market.

COAL—Imports the past week aggregate as follows: Coos Bay, 750 tons; Japan, 3530; Tacoma, 2400; Departure Bay, 8405; Seattle, 1435; Nanaimo, 3400, Newcastle, N. S. W., 3556; total, 23,476 tons. The market for spot is firmer, with a slight advance for Coos Bay. Owing to the lateness of the season, household coals, it is said, will not he advanced, but foreign steam may go higher, owing to firmer prices for forward shipments.

Mining Share Market.

SAN FRANCISCO, Dec. 15, 1892.

The action of the market the past week confirms those who have made it a close study for years, that it is under strong manipulation and that it is no novice doing the work. The running of Potosi and Bullion up while shading other shares off, with a final closing by a sharp break, created confusion in the ranks of outside dealers. While chronic outside traders were more or less demoralized, the movements inspired confidence with old-time dealers that better times may possibly he counted on in 1893. While believing in much better times, yet they are not disposed to take a hand at the game while the market is under manipulation, for experience has taught tnem that it is unsafe and far too risky, for, like a two-edged sword, it cuts both ways. Besides this, it is a well-established fact that often the inside, failing to accomplish their object, have withdrawn, and those who were tempted into dealing came out hurt, if not ruined financially. While saying this, it must not he supposed that manipulation is based on the condition of the mines, but purely and simply on street points and twenty-dollar pieces, both of which are deadly financial poisons, not only to the unsophisticated but also to those who had heaten the game. The manipulators' resources are unlimited and can he drawn on daily without depleting the supply for either breaking the market or for sending it up. The mines, machinery, mills, miners and millmen can be and are used by them. It is not saying too much when we affirm that the manipulators can have, if the end just fits, a small or big fire in any mine or mill. They can also have a break in some of the machinery at a mill or in a mine, which, in consequence, would cause work to be suspended. There are hundreds of ways of sending prices down besides that of reporting water, clay, quartz of no value, porphyry, etc. The above can be, and it is said are used to depress the market, get in shares, and also to give excuses for levying assessments. But, on the other hand, when the inside has too many shares on hand on which they are not overanxious to pay assessments, then there are big things near at hand, for they are going to uncover one of those hidden bonanzas. This was successfully used years ago by Levy, Borland and one or two more when making a deal in one or more of the middle mines. Miners play an important part in this game hy giving out "strictly private" information of a strike of rich ore, and similar advices calculated to tempt the cupidity of suckers.

The MINING AND SCIENTIFIC PRESS, over three years ago, contended that there was a west lode, known to many as the Red lode, and that it was gold and not silver bearing. Our contention, which at that time was denied, is now fully verified, but the public must not run away with the idea that the lode will prove a big bonanza, for so far, when it has been run into by work to the west, it is narrow; that is, narrow for the Comstock, and while the ore in parts of it assays high, yet when it is milled, it will not average high. Then there is another serious point which must not be lost sight of, viz.: that after the lode is struck it takes time to get it into working condition. Upraises, winzes, drifts and crosscuts have to be run, all taking time and calling for money. After opening up one level, in far too many cases, it will be found necessary to start work on a still lower level to strike the lode in its downward continuation, by which a large saving can be made. It is well enough for operators to keep the above in mind, and not run away with the

idea that a strike is to be followed soon by ore-extracting, milling and dividends. It is this impression that has swamped the many who have dealt on information from the mines, without considering the same from a business point of view.

The bottled-up gas in Con-Virginia was brought into play the past week and asphyxiated about every dealer in Comstock shares. After the havoc, that very truthful man, Mr. Lyman, superintendent of the mine, commenced work to rebottle the compound, which he has succeeded in doing. Of course, it is to be brought into service again at some future time, if R. F. Morrow does not surreptitiously get it for use as a motor power for pumping out the Gold Hill mines. But, on second thought, perhaps this would be poor policy, for it would seem that it would be better to stop pumping out the Gold Hill mines and let them fill up, so as to complete the demoralization in the share market. It is a great game this of working the Comstock mines.

The market opened this (Thursday) morning fairly active at slightly firmer prices. An assessment on Con. Virginia, Yellow Jacket, Challenge and two or three others, with an assessment pending on Ophir and Crown Point, followed in January or February by assessments on Seg. Belcher and Belcher, cause the market to wear anything but an attractive appearance to outsiders; and when this is the case, insiders operate to get all the shares they can.

From the Bodie district our advices are confirmatory that the electric plant will be in operation before spring, and that there is no doubt of its revolutionizing mining in that district. This probably accounts for the steady buying of shares in that district under the most adverse circumstances, and to make the buying more successful, the shares have been unduly depressed.

From the Comstock mines our advices are quite encouraging. In the Union-Sierra Nevada west cross drift, on the 900-foot level, the reported strike is confirmed and that it may prove to be more important than had been looked for. In Mexican they are working in interesting ground. In Con. Virginia on the 1600-foot level, in the northwest drift, an important strike has been made, which, when developed, may again give that old reliable proposition a new lease of life. On the 1800-foot level in Hale & Norcross they are developing the ore reported by Senator Fair at the time he was superintendent of that mine about 18 years ago. Some of the reports current say that it is proving to be important and may be quite valuable. Belcher has stopped shipping ore to the mill, owing to the mill running on Yellow Jacket ore. The milling of ore by Yellow Jacket probably accounts for the 30-cent assessment. Advices from the other mines are of the usual tenor that has been reported for weeks past.

At the 2:30 session the Comstocks developed more strength under an improved demand and higher bids for Belcher. After regular Call, Belcher was advanced to $2 a share, but toward the close it was weaker. It is said that there is an improvement in the mine; probably this is to offset the unfavorable effect that might follow when it is known that the mill has been turned over to Yellow Jacket, yet the move may be genuine.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13½	English, lb	— @ 18
BORAX.		Canton tool	— @ 8½
Refined, in car lots	— @ 7½	Bl'k Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	10 @ 20
Concentrated, do	@ 5	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 5 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 6 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @11 75
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot, lb	— @ 23
Norway, base	— @ 4½	**COAL.**	
PIG IRON.	Spot.	**SPOT FROM YARD—PER TON.**	
Eglinton, ton	20 00@—	Wellington	$8 00
Glengarnock	21 00@—	Greta	7 50
Am. Soft, No. 1	22 50@—	Nanaimo	5 50
Oregon Pig	—@—	Gilman	5 00
Puget Sound	—@—	Seattle	5 00
Clay Lane White	22 00@—	Coos Bay	5 50
Langloan	22 50@—	Cannel	8 50
Thorncliffe	23 00@—	Egg hard	12 00
Gartsherrie	22 50@—	Cumberland, in sacks	15 50
Barrow	22 50@—	Do, bulk	14 00
Carnforth	22 00@—	Wallsend	7 25
CHROME IRON ORE.		Scotch Splint	7 50
Per ton	10 00 @— —	Brymbo	7 50
LEAD.		West Hartley	7 50
Pig	— @ 4½	**TO LOAD—PER TON.**	
Bar	— @ 5½	Australian	5 25@— —
Sheet	— @ 6½	Scotch Splint	5 37½@— —
Pipe	— @ 6½	Cardiff	6 37½@— —
SHOT.		Lehigh Lump	15 00@— —
Drop, sizes *smaller* than		Cumberland	13 00@— —
B, bag of 25 lbs	$1 85	Egg, hard	11 00@— —
Do do, B and *larger* sizes		West Hartley	7 25@— —
bag of 25 lbs	2 10	**COKE.**	
Buck, Balls and Chilled		English, to load	38 00@ 9 00
do, bag of 25 lbs	2 10	Do, spot, in bulk	—@10 00
QUICKSILVER.		Do, in sacks	—@12 00
Home trade, pr. flask	41 50 @42 00	Cumberland	9 00@— —
For export	35 50 @36 00		

Eastern Metal Markets.

NEW YORK, Dec. 15.—The following are the closing prices the past week :

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	38½	82½	12 20	3 75	19 50
Friday	38½	82½	12 20	3 75	19 90
Saturday	38⅜	83½	12 20	3 75	19 90
Monday	38¼	83¼	12 25	3 75	19 95
Tuesday	38¼	83	12 25	3 75	19 55
Wednesday	38½	82½	12 25	3 75	19 50

Borax is firm under an enlarged demand. Quicksilver is steady. Pig iron is unchanged. Lead is weak, as is pig tin. Copper is fairly firm.

THE ELECTRO METALLURGY OF ZINC.—In order to prevent zinc from being deposited in a spongy state with the occlusion of hydrogen, Messrs. Siemens & Halske have added to the electrolyte a substance capable of combining with the hydrogen as fast as it is produced. This substance should be a weak solution of chlorine, bromine, or iodine, or hypochloric or hypobromic acid, or even an organic compound of chlorine such as hydrochlorine of glycerin, or glycol. The quantity added should be very small, and the deposit will be found to be quite solid.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DEC. 6, 1892.

487 467.—FILTERING SYSTEM - R. Beyerle, Los Angeles, Cal.

487 694.—CAR COUPLING—T. B. Brower, Templeton, Cal.

487,249 —VALVE GEAR—S. Chaplin, Buckley, Wash.

487 555.—TRACK BRAKE—H. E Dikeman, Berkeley, Cal.

487,557.—LOGGING ROADWAY—David Evans, Eureka, Cal.

487,261.—ORE CONCENTRATOR—A. Fraser, S. F.

487,523.—ORE CONCENTRATOR—A. Gonzalez, S. F.

487,571.—CAN-LACQUERING MACHINE—R. D. Hume, Gold Beach, Or.

487,572.—ORE CAR—F. A. Huntington, S F.

487,627.—LAST—A. M. Leighton, Port Townsend, Wash.

487,370.—ICE-CREAM FREEZER—H. Mayers, S. F.

487,578.—PLOW—F. S. Moore, Hanford, Cal.

487,409.—VENDING MACHINE—Robt. Moran, Seattle, Wash.

487,295.—CAMERA TAIPON—J. Rodes, San Diego, Cal.

487,585.—COVERING FOR BUILDINGS—M. P. Schetzel, S. F.

487,430.—BED BOTTOM—W. H. Scott, S. F.

487,336.—GATE—C. J. Simeral, Macleay, Or.

487,434.—PIPE COUPLING—E. T. Steen, S. F.

487,589.—ROUTING MACHINE—M. A. Taylor, Oakland, Cal.

487,340.—RAIL JOINT—Geo. Weeks, Oakland, Cal.

The following brief list by telegraph, for Dec. 13, will appear more complete on receipt of mail advices:

San Francisco—Henry C. Finkler, roller brake; George Harvy, snatch block; Charles C. Haub and J. F. Dasha, car-coupling; James W. Kinman, swinging crane; Bartlett McIntire, clip for wire-ropeways; William E. Walsh, means for transmitting power.

California—James Birch, North Ontario, cultivator; Christian Koenig, Stockton, tricycle; James Lamb, San Jose, horseshoeing apparatus; Willis H. Ostrander, Merced, repeating breech-loading gun.

Washington—Robert W. Murphy, Seattle, ink-roller for printing press; Ulysses H Rush, Tacoma, photographic printing apparatus and process.

Arizona—George W. Narton, Yuma, automatic water-gate.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. In the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

LOGGING ROADWAY.—David Evans, Eureka, Humboldt county, Cal. No. 487,557. Dated Dec. 6, 1892. The invention relates to a roadway for effecting the transportation of logs from the woods to the mill or log-landings or to other suitable points. It contemplates the employment of a traveling cable, driven by suitable winding drums, said cable being directed through any suitable course required beside a similarly directed foundation or roadbed upon which the logs rest and over which they are dragged by connections with the traveling cable. In the lumber regions, especially those of California, the courses over which it is practicable to lay the road are devious, having many and sharp curves. The object of the invention is to provide such a construction of a logging roadway employing a traveling cable as will provide for the proper and effective turning of the log or any train of logs about the curves. To this end the invention consists of a roadbed or foundation, either plane-surfaced or ordinary dirt or formed of skids, this roadbed or foundation at the curves having a lateral slope away and downwardly from the inner arc of the curve and toward the outer arc thereof, and in connection with this roadbed a moving or traveling cable properly connected with the log or with the log-train, and fixed receiving and guide sheaves in the line of the inner arc of the curve in position to receive the cable after the log-train has passed. In this roadway the inventor accomplishes the free passage of the log-train around the curve, notwithstanding its attachment to the moving cable, by reason of the outward slope of the roadbed, which permits the train to pass around and at the same time provides for the proper guidance and removal of the rope from its sheaves at the time the train is passing and its return to said sheaves after it has passed.

CAN LACQUERING MACHINE.—Robert D. Hume, Gold Beach, Oregon. No 487,571. Dated Dec. 6, 1892. This patent covers certain details of construction in a machine which is adapted to apply lacquer to the exterior surfaces of cans containing hermetically-sealed goods, the lacquer being applied after the cans are filled and sealed for the purpose of giving a finish to them.

COVERING FOR BUILDINGS.—M P. Schetzel, San Francisco. No. 487,585. Dated Dec. 6, 1892. This outside covering for buildings consists in a peculiar construction of the main supports or rafters, with intermediate diagonal supports extending between the main ones, and in novel covering plates which are fitted to these supports.

TRACK-BRAKE.—Henry F. Dikeman, Berkeley No. 487,555. Dated Dec. 6, 1892. This improved brake for railway cars consists of peculiarly arranged shoes attached to a vertically-moving brake-beam mechanism, by which said beam is actuated to produce a vertical movement from the horizontal movement of the power-rod and in certain details of construction.

ROUTING MACHINE.—Melvin A. Taylor, Oakland, assignor of one-half to George M. Blair. No. 487,589. Dated Dec. 6, 1892. This invention relates to certain improvements in what are known as routing-machines. The improvements are especially adapted for routing the channels in the side rails of stairs, and the invention consists in certain details of construction.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 22.		Week Ending Nov. 30.		Week Ending Dec. 7.		Week Ending Dec. 14	
Alpha	.25	.30	.25	....	.25	....	.20	.25
Alta	.25	.30	.25	....	.30	....	.20	.35
Andes	.45	.55	.45	....	.45	....	.30	.45
Belcher	1.60	2.50	1.60	1.85	1.55	2.00	1.35	1.80
Belle Isle	.05	....	....	....	....	....	....	....
Best & Belcher	1.45	1.85	1.40	1.50	1.40	1.50	1.15	1.55
Bullion	.50	*.85	.50	.90	.70	.85	.80	1.20
Bodie Con	.15	.25	....	....	.25	.30	.15	.25
Bulwer	.20	....	....	....	.20	....	....	....
Commonwealth	....	....	....	....	....	....	....	....
Con. Va. & Cal	2 55	3.25	2.50	2.90	2.60	2.75	1.60	2.55
Challenge	.55	.75	.55	.70	.35	.50	.30	.60
Choliar	.75	1.30	.70	.95	.80	.95	.70	.95
Confidence	1.80	2.00	1.95	2.00	2.25	2.75	1.65	2.35
Con. Imperial	....	....	....	....	....	....	....	....
Caledonia	.20	.25	....	....	.20	.30	.15	.20
Crown Point	1.00	1.85	.95	1.10	.95	1.15	.75	1.00
Crocker	....	....	....	....	.05	....	....	....
Del Monte	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.15	.20	.10	.25	.20	.30	.20	.30
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.85	1.20	.70	.85	.75	.90	.50	.85
Hale & Norcross	1.45	2.10	1.35	1.70	1.55	1.90	1.25	1.65
Julia	.10	....	....	....	.05	....	....	....
Justice	.20	.30	.25	....	.30	.50	.25	.35
Kentuck	.20	....	.15	....	.20	.30	.25	....
Lady Wash	.10	....	.10	....	.15	....	.15	....
Mono	.25	....	.15	....	.25	....	.15	.25
Mexican	1.50	1.90	1.50	1.55	1.45	1.55	1.15	1.55
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	.05	....	....	....	....	....	.10	....
Nev. Queen	.05	....	....	....	....	....	....	....
Occidental	.10	.15	.30	.35	.40	.45	.35	.45
Ophir	2.55	3.20	2.55	2.80	2.40	2.70	1.55	2.75
Overman	.50	.90	.50	.70	.60	.70	.40	.50
Potosi	1.40	2.45	1.25	2.10	1.75	2.10	1.75	2.60
Peerless	....	....	....	....	....	....	....	....
Peer	....	....	....	....	....	....	.10	....
Savage	1 25	1.80	1.20	1.35	1.25	1.35	1 10	1.30
S. B. & M	.30	.50	.25	.30	.30	.35	.15	.30
Sierra Nevada	1.15	1.50	1.15	1.25	1.00	1.30	1.05	*1.45
Silver Hill	.10	....	.10	....	.15	....	.15	....
Scorpion	.10	....	....	....	.10	....	.05	....
Union Con	1.15	1.55	1.15	1.25	1.10	1.25	1.03	1.25
Utah	.10	.20	.10	....	.10	.15	.05	.10
Yellow Jacket	.85	1.15	.80	.90	.70	.90	.45	.75

*Assessment added.

California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information.. No 220 Market St., San Francisco Cal.

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ASSESSMENTS.

Company and Location	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belle Isle M Co, Nev	5	10c	Nov 5, Dec 7, Jan 4	J W Pew, 310 Pine
California Iron and Steel Co, California	7	20c	Nov 25, Dec 31, Jan 23	F Bonacina, 428 California
Curra M & M Co			Sept 28, Nov 28, Dec 28	C C Coleman, 15 Fremont
Challenge Cons M Co, Nevada	13	25c	Nov 30, Jan 25	C L McCoy, Mills Building
Clifton Con G M Co, California	1	50c	Nov 12, Dec 15, Jan 7	C F Gunn, Mills Building
Commonwealth Cons M C, Nevada	10	10c	Nov 53, Dec 28, Jan 24	R R Grayson, 331 Pine
Cons California and Virginia M Co, Nevada	3	50c	Dec 13, Jan 21, Feb 16	A W Hevens, 3 9 Montgomery
Con Imperial M Co, Nevada	34	5c	Nov 22, Dec 29, Jan 19	C L McCoy, Mills Building
Cons New York M Co, Nevada	9	1c	Nov 2, Dec 5, Dec 18	C E Elliott, 309 Montgomery
Del Monte M Co, Nevada	7	10c	Nov 22, Dec 27, Jan 21	J W Pew, 310 Pine
El Leopoldo G & S M Co, Mexico	1	10c	Nov 11, Dec 14, Jan 2	Jabez Howes, 130 Sansome
East Best & Belcher M Co, Nevada	3	20c	Nov 23, Dec 29, Jan 18	C H Mason, 324½ Montgomery
Evening Star M Co, California	7	1c	Dec 6, Jan 12 Jan 31	J J Scoville, 320 Sansome
Exchequer M Co, Nevada	34	10c	Oct 28, Nov 30, Dec 26	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nevada	70	25c	Nov 22, Dec 28, Jan 20	A K Durbrow, 309 Montgomery
Indian Creek L & M Co, California	3	10c	Nov 4, Dec 14, Jan 6	S C Mills, Mills B'd'g
Keyes S M Co, Nevada	5	25c	Nov 2, Dec 6, Dec 27	J H Hayes, 328 Montgomery
Louvre Cons G M Co, California	1	5c	Nov 9, Dec 14 Dec 30	J F Holling, 413 Leidesdorff
Martin White M Co, Nevada	28	25c	Nov 26, Jan 15 Feb 20	K L Ross, 120 Sutter
Navajo M Co, Nevada	23	10c	Nov 5, Dec 9, Dec 30	J W Pew, 310 Pine
North Belle Isle M Co, Nevada	21	10c	Nov 14, Dec 20, Jan 17	J W Pew, 310 Pine
North Gould & Curry M Co, Nevada	14	10c	Nov 21, Dec 24, Jan 16	C H Mason, 324½ Montgomery
Occidental Cons M Co, Nevada	11	25c	Oct 25, Nov 30, Dec 21	A K Durbrow, 309 Montgomery
Russell Reduction & M Co, California	8	1c	Nov 14, Dec 19, Jan 15	J Morizio, 33 Geary
Sierra Nevada S M Co, Nev	103	25c	Nov 8, Dec 14, Jan 3	E L Parker, 309 Montgomery
Silver Hill Con M Co, Nevada	3	2c	Nov 22, Jan 3, Jan 25	W Ladd, 331 California
South Eureka M Co, Cal	1	2c	Nov 3, Dec 9, Dec 31	A Halsey, 328 Montgomery
Utah Cons M Co, Nevada	16	10c	Dec 13, Jan 19, Feb 9	A H Fish, 309 Montgomery
Yellow Jacket S M Co, Nevada	53	30c	Dec 5, Jan 10, Feb 14	W H Blanvelt, Gold Hill

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Andes Silver M Co, Nevada	Annual	W Twiggs, 309 Montgomery	Dec 19
Argenta M Co, Nevada	Annual	R R Grayson, 331 Pine	Jan 9
Bradshaw M Co	Annual	H P Bush, 430 California	Dec 24
Bullion M Co, Nevada	Annual	R R Grayson, 331 Pine	Jan 12
Elko Cone M Co	Annual	J W Pew, 310 Pine	Dec 19
Gould & Curry S M Co, Nevada	Annual	A K Durbrow, 309 Montgomery	Dec 19
Keutuck Cons M Co, Nevada	Annual	J W Pew, 310 Pine	Dec 21
Ophir S M Co, Utah	Annual	I C Stump, Mills Building	Dec 17
Ophir M Co, Nevada	Annual	F B Holmes, 309 Montgomery	Dec 27
Pacific Coast Borax Co, California	Special	A H Clough, 103 Sansome	Feb 18

DIVIDENDS.

Company and Location.	Amount.	Secretary and Office in S. F.	Payable
Bulwer Cons M Co, California	5	L Osborn, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 310 Pine	Dec 19
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Dec 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	July 26

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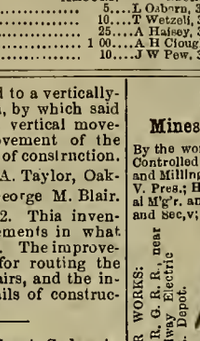

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If the results of the tests are favorable, we will then make arrangements to treat a quantity of not less than five tons in Denver.

We are fully prepared to grant royalties to mine and mine owners, or rights covering districts and counties.

The process consists of pulverizing the ores to a fineness of about 50-mesh, and then subjecting the same to an action of a very diluted solution of cyanide. A few tube especially constructed according to our diagrams, for triturating, settling and filtering, is all that is required extra in connection with any kind of pulverizing stamps or rolls

The total cost, as a rule, does not exceed from $2.50 to $5 00 per ton.

The most desirable class of ores for this process is the so-called refractory gold ores, pyrites, hematites, manganese and tellurium. We have also treated successfully dry silver ores.

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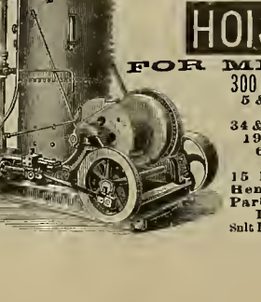

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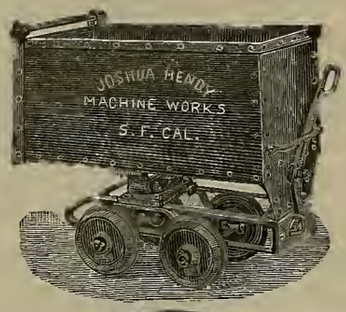

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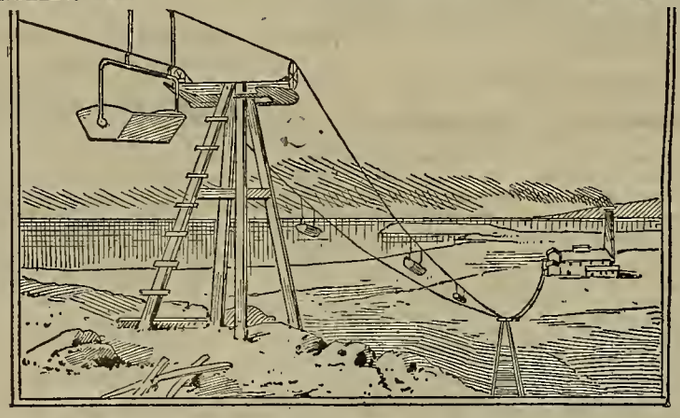

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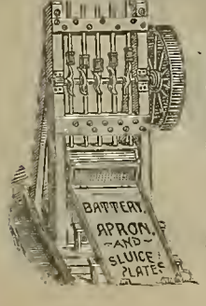

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An Illustrated Journal of Mining, Mechanics and Popular Science.

VOL LXV.—Number 26. DEWEY PUBLISHING CO.

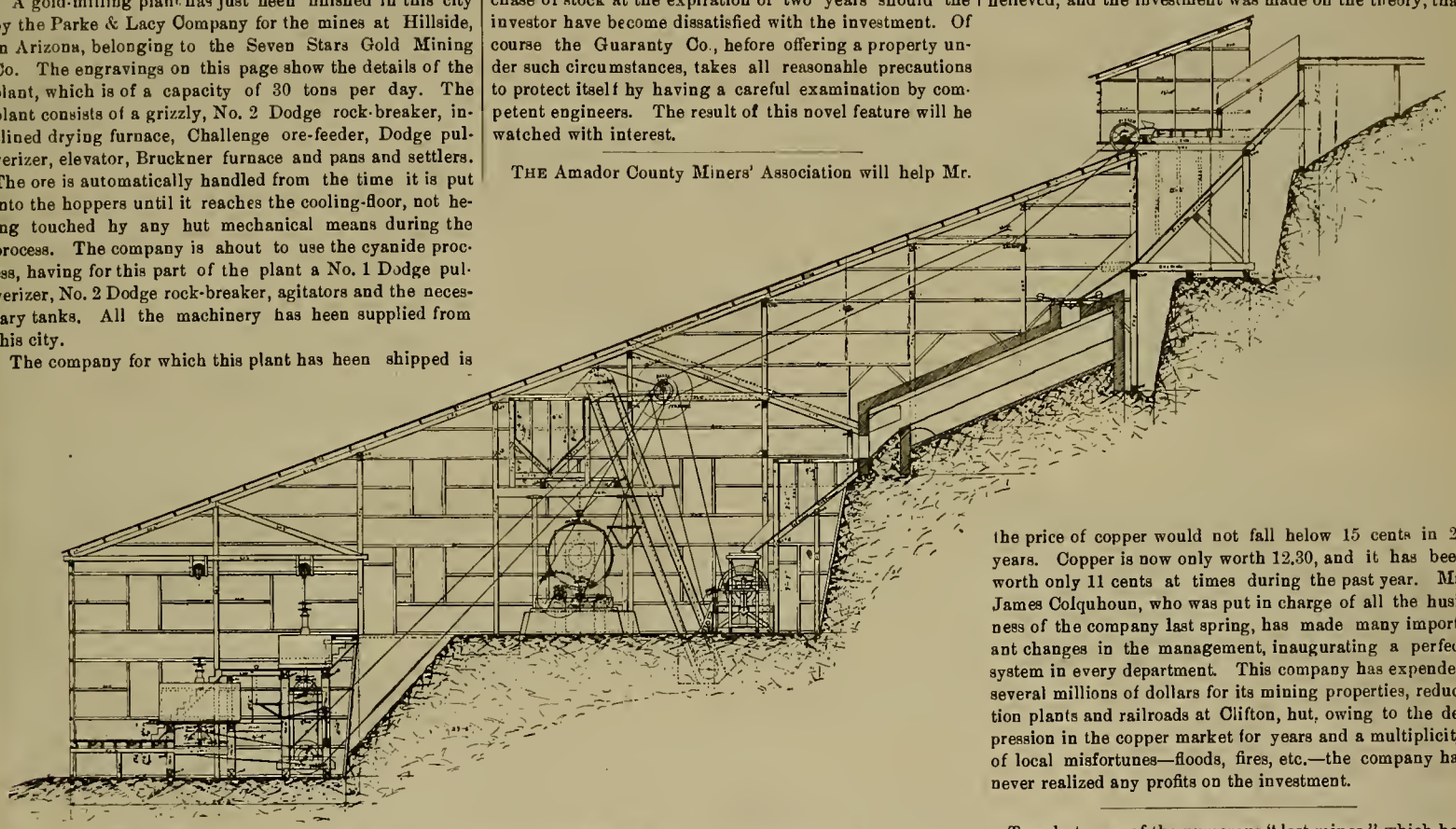
SAN FRANCISCO, SATURDAY, DECEMBER 24, 1892.

Three Dollars per Annum. SINGLE COPIES, 10 CENTS.

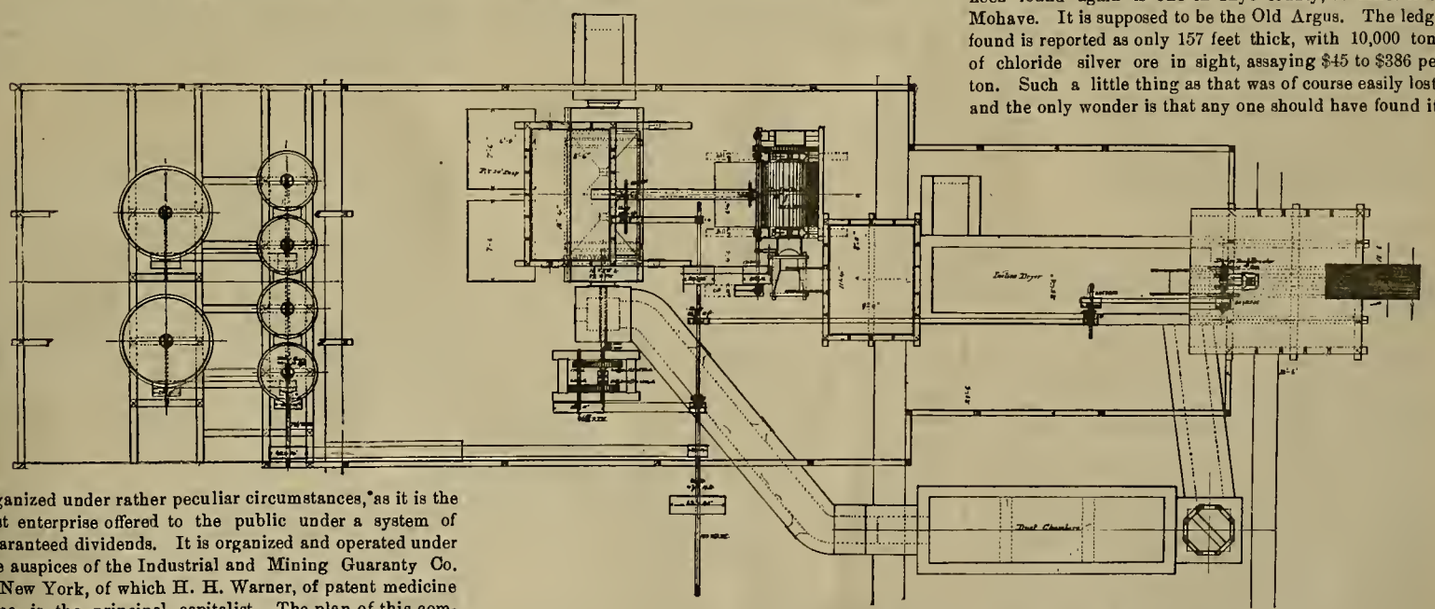
The New Gold Milling Plant at Hillside.

A gold-milling plant has just been finished in this city by the Parke & Lacy Company for the mines at Hillside, in Arizona, belonging to the Seven Stars Gold Mining Co. The engravings on this page show the details of the plant, which is of a capacity of 30 tons per day. The plant consists of a grizzly, No. 2 Dodge rock-breaker, inclined drying furnace, Challenge ore-feeder, Dodge pulverizer, elevator, Bruckner furnace and pans and settlers. The ore is automatically handled from the time it is put into the hoppers until it reaches the cooling-floor, not being touched by any hut mechanical means during the process. The company is about to use the cyanide process, having for this part of the plant a No. 1 Dodge pulverizer, No. 2 Dodge rock-breaker, agitators and the necessary tanks. All the machinery has been supplied from this city.

The company for which this plant has been shipped is organized under rather peculiar circumstances, as it is the first enterprise offered to the public under a system of guaranteed dividends. It is organized and operated under the auspices of the Industrial and Mining Guaranty Co. of New York, of which H. H. Warner, of patent medicine fame, is the principal capitalist. The plan of this company is to eliminate, to a certain extent, the speculative feature from mining investments. The company will protect the stock it sells and guarantee the payment of a stipulated interest thereon for five years. In the case of the Seven Stars Co. the stock was sold at $5 per share and 15 per cent per annum guaranteed for five years. The prospectus also contains a clause providing for the purchase of stock at the expiration of two years should the investor have become dissatisfied with the investment. Of course the Guaranty Co., before offering a property under such circumstances, takes all reasonable precautions to protect itself by having a careful examination by competent engineers. The result of this novel feature will be watched with interest.



THE NEW MILL OF THE SEVEN STARS GOLD MINING CO., HILLSDALE, ARIZONA.



PLAN OF THE SEVEN STARS GOLD MILL.

THE Amador County Miners' Association will help Mr. A. B. Call, appointed committeeman by the State Association, to prepare a mineral exhibit of that county for the World's Fair Association.

WHEN the Arizona Copper Company purchased the Clifton properties copper was worth 18 cents. It was then believed, and the investment was made on the theory, that the price of copper would not fall below 15 cents in 20 years. Copper is now only worth 12.30, and it has been worth only 11 cents at times during the past year. Mr. James Colquhoun, who was put in charge of all the business of the company last spring, has made many important changes in the management, inaugurating a perfect system in every department. This company has expended several millions of dollars for its mining properties, reduction plants and railroads at Clifton, but, owing to the depression in the copper market for years and a multiplicity of local misfortunes—floods, fires, etc.—the company has never realized any profits on the investment.

THE last one of the numerous "lost mines" which has been found again is one in Inyo county, 80 miles from Mohave. It is supposed to be the Old Argus. The ledge found is reported as only 157 feet thick, with 10,000 tons of chloride silver ore in sight, assaying $45 to $336 per ton. Such a little thing as that was of course easily lost, and the only wonder is that any one should have found it. It would be a good kind of mine to keep hunting for, as any amount of "grub stakes" could have been had with such a prospect in view.

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San Francisco, December 24, 1892.

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Comment.

The drafts of men from leading mines on the Comstock, Nevada and Park City, Utah, during the past few weeks show what is bound to come in other silver mining camps if the price of the white metal goes any lower. In Park City there will be a difference of some $12,000 a month in the pay rolls, and it will amount to more than that at Virginia. The question is, where are these surplus miners to go to for work? All the silver camps are dull, with a prospect of being still duller. It is useless for miners to go wandering off looking for work in camps where men are being discharged. The outlook is rather discouraging.

While silver is selling at 83 cents and lead at $3.70 per hundred pounds, the silver-lead mining camps cannot well prosper. Many mines have shut down and more must follow, unless there is a reaction in values of these metals. California is but slightly affected since its principal product is gold; but Colorado, Utah, Montana, Nevada and Idaho will all feel the effect on their mining operations. The bullion product of those regions must necessarily fall off under these conditions and many men will be thrown out of work. There will be more prospectors in the field, however, as the unemployed miners will take to the mountains on their own account in the spring. They will hunt for gold, coal, etc., and many discoveries may be looked for when the snow leaves the ranges.

The formation of an industrial and mining guaranty company in New York recently should be a good thing for investors as well as for those having good properties which they wish to put on the market, provided it does all it promises. The scope of the new company's work is to take charge of sound enterprises where the plans are projected on legitimate business lines. They profess to have nothing to do with schemes, as schemes. If a man or a syndicate comes to them with an enterprise to be promoted, the enterprise is subjected to rigid investigation. This it must bear unscathed; still an acceptable business is not always accepted by the company. There are conditions to be complied with to which all are not willing to accede. These conditions may be summed up in a sentence. The vendors of an enterprise must put up sufficient capital to pay a guaranteed interest for five years. This being done and the other features being favorable the company organizes the subcompany and puts it on the market guaranteeing not only that the principal invested is secure but that a stipulated interest will be paid for five years. The new company is a promoter pure and simple, but it is not a promoter after the manner of those who float the stock of enterprises, and, having unloaded on the market, step aside and let the investors look out for themselves. At least that is the view of the head of the enterprise, Mr. H. H. Warner, the millionaire patent medicine man of New York. The first mining enterprise started by the new company is referred to on the first page of the PRESS of this week. Such a plan carried out in good faith should work a revolution in the stock business and give some of the investors a chance to make money as well as those who float new enterprises.

At least two of the recent mining excitements have turned out well and with good results—Cripple Creek, in Colorado, and White Hills in Arizona. Of course some of the claims concerning them were exaggerated at first, and as yet there have been no very extensive deep developments. Still, the prospects are quite favorable. In the White Hills the ledges are small but rich, and not the kind that big companies care to take hold of. In the Colorado camp, however, a good deal of capital is being invested and a branch railroad now being built will insure cheap transportation. There has been more of a rush to Cripple Creek than to the Arizona camp, but in both cases the miners who went have remained. This is a good indication of permanency in both districts.

The term of Wm. Irelan Jr., State Mineralogist, runs out in a few mouths, and it will be the duty of the Governor to appoint a new official or reappoint the old one. Mr. Irelan has prepared a strong petition for continuance in his position, and is backed by many prominent mining men. He has held the office many years, during which time he has formed a wide circle of acquaintances in the different mining counties of the State. His most prominent opponent for the position is Wm. C. Ralston, the efficient secretary of the State Miners' Association, and who acted as secretary of the State Mining Conventions of January and November. Mr. Ralston, after taking the mining course at the State University, spent a year or two at practical mining, eventually becoming superintendent of a drift mine in Placer county. He is an active and very energetic young man with many friends in the mining and business community, and would doubtless try his best to make the Bureau practically useful to the mining public. Another applicant for the position is Mr. J. J. Crawford of El Dorado county, who served on the Committee on Resolutions at the recent State Miners' Convention. Mr. Crawford is equipped with a good knowledge of mining matters, and is fully competent to undertake the duties of State Mineralogist if selected. The names of Louis Janin and Ross E. Browne have been mentioned in connection with this office, but neither of these gentlemen are applicants for the position. The selection rests entirely with the Governor, who has thus far expressed no preference and given no hint as to what his action will be. In all probability the appointment will not be made until after the legislature meets, since the report of the State Mineralogist has been referred by the State Board of Examiners to that body, which will doubtless result in a special committee examining into the affairs of the Bureau, at least so far as publication of its reports are concerned. The Governor will be apt to wait for some action by the legislature before considering the appointment to be made.

On page 413 will be found a sketch of the plan for the proposed topographical survey of California. The method by which the work could be carried out is fully stated in the article referred to. The committees appointed to consider the matter have reported favorably on the project, which is now submitted to the people of the State. It is to be noted that only the valley and foothill areas are to be considered, the mountain and mining regions being omitted from the plan. The subject, therefore, interests the agricultural population more than it does the miners. The work is to be entirely topographical, as there would be no geological work in the great valley of the State. For this reason it is the opinion of some engineers that such a survey should be carried out by the U. S. Coast and Geodetic Survey instead of the U. S. Geological Survey. There is, in fact, some difference of opinion concerning the whole matter, it being agreed by certain engineers that the proposed scale is not sufficiently large to serve a useful purpose in irrigation matters, for example. The expense, as stated, would be decided between the State and the Government. As the complete plan is now formulated and in shape for consideration, a discussion of the details is in order.

UNLESS the mining community gives some voluntary assistance to the California World's Fair Commissioners in sending specimens, etc., the exhibit of this State at Chicago will fall far short of expectations. Thus far the people in the mining counties have been rather apathetic.

Foundry Notes.

For the two contracts to dredge the channels in Oakland harbor a powerful dredger of a new pattern, after the patent of Wm. P. Humphreys, is now being built in this city by the National Iron Works. The dredger will cost $55,000, including the pontoons and pipes. There are two contracts. One is for work from the Webster-street bridge, over which the narrow-gauge trains run between Oakland and Alameda westward toward the bay, a distance of about 4000 feet, and the other, in front of Brooklyn, is to be a semicircular channel between 4500 and 5000 feet long. The first contract is to dredge out a channel which shall be 20 feet deep at low water, 300 feet wide, and will require the removal of about 240,000 cubic yards of earth. It is estimated that this work will cost about $96,000. The Brooklyn channel must be eight feet deep at low water, and will require the removal by dredgers of about 220,000 cubic yards of earth, at a cost of $26,000. The sum involved in the two contracts is about $122,000, though the exact amount depends upon the quantity of earth removed in the dredging. All the soil moved must be banked up on either shore in such a manner that it cannot again slide back into the channels made, and all along the edge of the channel a properly piled wharf will be formed, though the building of the wharves is no part of these contracts. It is estimated that all the work on both portions of the channel will be finished in eight months. Work is to be commenced not later than April 1st, and the new dredger will be done before that time. The dredger will require 11 men to haudle, and will be kept working night and day until the two contracts have been completed and the work has been accepted by the Government. The object of this work is to make deep-water wharfage for large-sized vessels. which will be able to load directly from the railroad. At present the depth of water varies from 7 to 12 feet, and with 20 feet at low water there will be draft enough for good-sized graiu ships to go alongside and load just as they now take in coal on the long wharf to the north of the Oakland mole. The contracts let represent about half of the dredging work to be done on the estuary alone, and are the first which will carry the channel to the depth required by the Government.

The Pacific Rolling Mills have not closed down as announced in the daily papers. The usual annual repairs and stock-taking are going on, during which time of course they are running short-handed.

Mr. Graham, of the Vulcan Iron Works, who has been abroad for two months past, has returned.

The preliminary trial trips of the Monterey were made on the bay this week. These trials are not official, but are being made by the builders, the Union Iron Works, so that the vessel may be in complete order and running smoothly when turned over to the Government officers. It is expected that the Monterey's official trial trip will take place very shortly from Hunters Point to Red Rock. To satisfy the conditions of the contract she must produce 5400 horse-power under forced draught, and the contractors will receive a premium of $100 for every horse-power developed in excess of that number. The trial board will consist of Rear-Admiral George Brown, Chief Engineer G. F. Kutz, Captain Louis Kempff, Chief Engineer G. J. Burnap, Lieutenant-Commander E. C. Pendleton, Lieutenants J. W. Carlin and R. S Nicholson, and Naval Constructor D. W. Taylor. The board of engineers will consist of Chief Engineer George F. Kutz, Chief Engineer James Trilley and Chief Engineer George J. Burnap, assisted by eight other subordinate naval engineers. The builders are reticent as to the results of the preliminary trials, and no details have been made public.

Although the Cramps underbid the Union Iron Works on both the new warships, Mr. Irving M. Scott still insists that one of the two should be built upon the Pacific coast, and he will endeavor to so impress the Navy Department. He believes that the award of the contract for one vessel can yet be made to him under the law, notwithstanding the fact that the Cramps were the lowest bidders on both ships. No formal decision has yet been reached in the matter, but it is understood the Secretary of the Navy would like to see a wider distribution of the work and is thinking seriously of awarding one of the contracts to the Union Iron Works of San Francisco, the next highest bidder. There is a difference of $54,000 between the bids of the Cramps and the Union Iron Works for the armored cruiser Brooklyn, and $140,000 for the battleship Iowa. In calculating the difference in the cost of construction between the East and the West it has been customary to add three per cent in favor of the Western firm. If this allowance is now made, the Union Iron Works would get the contract for the new cruiser. The difference between the bids for the battleship, however, exceeds three per cent. Mr. Cramp is, however, determined to keep his contracts, and says, as he made the lowest bid on both ships, he will build them.

The Board of State Prison Commissioners, at its last meeting at Folsom, gave a contract for furnishing the prison with six boilers and mountings to the Fulton Engineering and Ship-Building Company of this city for $6983.

About 100 of the carpenters and mechanics who have been working on the Monterey, at the Union Iron Works. have been discharged. Business is comparatively dull at the shops now, and there is great disappointment among the mechanics in seeing the Cramps of Philadelphia getting both the new vessels to he built. The Union Iron Works counted pretty surely on one of them.

Bids were opened at the Navy Department this week for the construction of an iron and steel pier at the United States coaling station in the harbor of Pago-Pago, Samoa. The two lowest bids were: Coronado Foundry Company, San Diego, $84,697; San Francisco Bridge Company, $88,900.

Personal.

W. J. URTON, of Tuscarora, Nev., is visiting the city.

F. CONN and E. Trudo, mine-owners of Big Pine, Inyo county, are in town.

WM. C. MURDOCK has been appointed a member of the State Fish Commission, vice Morizio, resigned.

W. W. VANDERBILT and Fred Little have taken a lease on the Silver Flake mine in the Agua Fria district, Arizona, and will work it.

GEORGE D. ROBERTS, the old-time Comstock operator, and Colonel D. H. Jackson are in this city after a visit to mining property in Mexico.

THE *Mountain Messenger* learns that Marcus Hobby and brother found a four-ounce nugget in the Live Oak claim, on Ram's Horn creek, last week.

DR. H. H. BEHR read a paper at the last meeting of the California Entomological Society on "The Connection Between Vegetable and Animal Life."

J. D. SCHUYLER, of San Diego, the well-known civil engineer who has been conducting extensive irrigation works in that county, is on a visit to San Francisco.

J. L. HOLLAND, formerly superintendent of the North Star mine in the East Fork district, Trinity county, is now superintending a placer mine at Lytton, British Columbia.

R. G. HART JR. is the superintendent in charge of the Old Diggings mine, and Glanville Hart is the superintendent of the Bullychoop group in western Shasta, belonging to R. G. Hart.

MAJOR Frank McLaughlin, of Oroville, Butte county, the manager of the big river-bed mining operations in that county, has gone East with his family to visit relatives during the holidays.

THE Trinity County Miners' Association, which completed its organization recently, has elected the following officers: Hon. John McMurray, president; J. R. Flagg and P. M. Paulsen, vice-presidents; C. W. Smith, secretary; D. P. Davis, treasurer.

W. A. MERRALLS, inventor of Merrall's system for extracting gold, and of several mechanical appliances for reducing and extracting gold, has established himself in this city. He has been for some time at Los Angeles, but finds San Francisco a better field for his work.

Mr. S. S. TAYLOR has come to San Francisco with the Plumas county mining exhibit, where it will be on display till next spring, when, along with other California exhibits, it will be sent to Chicago. Mr. Taylor has labored with much zeal to secure a collection fitly representing Plumas mining interests.

GENERAL W. S. ROSECRANS, Register of the Treasury, is coming to California to spend the winter in the hope of regaining his health. The General formerly lived here and was engaged in powder manufacture. He was also engaged in mining operations in this State. After going to Washington as a member of Congress from California he remained there, having received an appointment in the Treasury Department which he has since held.

W. C. MINEAR has left Jackson, Amador county, to go to Delta, Shasta county, to take charge of the interests of his father, A. P. Minear, in the Balakala Co., a California corporation, with its principal office in San Francisco. It is a consolidated mining property of 11 mines. The ore is a kind of black iron ore, with gold ranging from $14 to $30; besides it carries a very high percentage of silver, some of it going up into the hundreds of dollars per ton.

MR. C. J. BARBER, who has been for several months prospecting in San Bernardino and Los Angeles counties, has returned to this city. He is quite enthusiastic about some tin prospects which he has discovered and is now developing. He thinks there is plenty of tin in those two counties, and says that because prospectors do not get metal on the croppings they find they should not he discouraged. They will be apt to find the tin on sinking 40 or 50 feet where they find the "black stuff" on the surface.

The Idaho Diamond Fields.

The news from the diamond fields (?) in Idaho is rather sensational in character and hard to be relied upon. Mr. Sanders Kunz of New York, reported to be a representative of a great Amsterdam diamond firm, is reported to have said: "The geology of the country around the diamond fields is precisely the same as in the South African fields and not unlike the fields of Brazil, only not as much broken up. In my opinion these diamond fields will be larger than either those of Africa or Brazil, the blowouts or shafts being a great deal larger and more clearly defined." It is hardly probabe that Mr. Kunz made any such prediction as this after a mere preliminary examination of a day or two. Mr. Kunz is also reported as saying that it had been agreed by the locators that no work should be done upon the diamond ledge until he had returned from Chicago, in which city he would organize a powerful stock company.

The following information is condensed from a special dispatch from Boise to the *Examiner* of this city: "At no time since the reported discovery of diamonds in Idaho, the news of which was given exclusively in these dispatches, has the excitement been greater in Nampa and other surrounding towns than at the present moment. While the statements that the streets of Boise are thronged with eager prospectors are false, it cannot be denied that nearly every person in this city is taking an active interest in the reputed bonanza S. Kunz, the New York expert who went to Diamond Basin on Sunday, did not return to Boise last night, but went East from Nampa. He informed W. F. Mock, of the Nampa Board of Trade, that genuine diamonds really existed in the Diamond Basin region. In proof of this assertion he exhibited four or five small pebbles of peculiar shape, weight and color which he said were rough diamonds."

Coast Industrial Notes.

THE Government estimates for the Benicia arsenal aggregate $33,000. One of the items is for a sewer system to cost $15,000.

LOUIS DUNAND and others have been given the privilege of extending a street railroad from Thirty-fifth street and Potrero avenue.

THE Supervisors have refused to grant Charles Goodall and others the right to run an electric railroad on East street, Broadway and other thoroughfares.

THE State Harbor Commissioners have let a contract for repairing Washington, Jackson, Green, Union and other wharves to Darby, Laydon & Co. for $15.74 per pile.

ARCHITECT Page Brown has submitted to the State Harbor Commissioners further plans for the new depot building at the foot of Market street, and in a few days the board will settle definitely on a general plan.

THE U. S. Fish Commissioners' steamer Albatross will go into dock at Mare Island shortly. A large force of mechanics is at work on her boilers and machinery. Her two Herreshoff steam launches are also undergoing repairs.

AT the last meeting of the Supervisors of this city and county, the order granting the Municipal Conduit Company a franchise to lay pipes and pneumatic tubes for conveying messages and packages throughout the streets of the city was finally passed.

FELIX CHAPPELLET has written a letter in which he promises that his proposed electric road from Haywards to San Jose will be built within the time required by law. He has yet two years in which to complete the work. Enough road has been laid to simply hold the franchises.

THE Howland olive-oil mill at Pomona is nearly completed, and the manufacture of oil will commence shortly. Some of the machinery was imported from Europe, and the capacity of the mill is greater than that of the similar establishments at Elwood Cooper's ranch and National City.

CITIZENS of Fresno have held another meeting to consider the projected railroad between Fresno and Monterey. The road is to be built by people in Fresno, San Benito and Monterey counties. The Fresno people subscribed half of the sum they were to raise at a previous meeting, and at a meeting this week a committee was appointed to solicit the remainder.

LEWIS ANDERSON & Co., the shipping agents of this city, have made arrangements to add a steam vessel to their whaling fleet. Several of their barks have already started on cruises, and the new vessel, which is named the Navarch, is now on her way to Honolulu. From there she will continue her cruise north, and come here next year at the end of the season.

THE Round Valley dam, near Greenville, Plumas county, did not go out during the recent storm as reported. The Round Valley Reservoir dam is intact, and is not at all likely to be dislodged from its secure position. Several years ago the dam was materially strengthened, and it has "waste-gates" by which the water can be prevented from rising above a certain point.

AT Mare Island Navy Yard the Monadnock will soon be hauled up under the big shears, and as her boilers and machinery are being put in and set up, it will then begin to look in reality that she is fast approaching the state to make her an engine of war and destruction. Her guns at Washington are nearly completed, and if required could be brought here on short notice.

THE Oakland Consolidated Street Railroad Company is making another extension to its system. A force of men has been put at work laying tracks down Grove street to Eighth and thence to West Oakland, paralleling the Southern Pacific Company. This will make the third branch from the main system on this road. It is proposed to form a circle by running out Peralta street.

THE Consolidated Piedmont Cable Company of Oakland have applied to the Supervisors to have an ordinance amended so that electricity may be used on their road to the Mountain View Cemetery. When the ordinance was granted originally no provision was made for the use of electricity. The officers of the company say that they are satisfied with the cable system at present, but may in the future replace it by electricity.

THE Nevada City *Transcript* says there is no question about an electric railroad being built between that city and Grass Valley just as soon as the franchise is obtained. A company has already been formed, and Peter Tauthaus, President of the Providence Mining Company, is at the head of it, and all they are waiting for is a franchise from the Boards of Trustees of Nevada City and Grass Valley and from the Board of Supervisors of the county. As soon as these are obtained the work will be commenced.

THE Sacramento Council of the Federated Trades have appeared before the Prison Commissioners and urged the enforcement of the eight-hour law in the employment of guards and others at the Folsom prison. After considerable discussion the board went into executive session and decided to make a supplemental report to the Governor, concluding as follows: "This board believing that in all proper cases eight hours should constitute a day's work, desire to refer the matter to the legislature for such legislation and increased appropriations as may be necessary. This board would respectfully urge you therefore to transmit this report to the legisla'ure."

ONE of the largest wooden sailing vessels ever built in California was launched in Humboldt Bay, on Tuesday, from Bendixsen's shipyard. She is a four-masted barkentine, built for J. J. Smith of San Francisco, and is named the Jane L. Stanford in honor of the wife of Senator Stanford. Her measurements are 200 feet keel, 240 feet over all, 41 feet beam, 16 feet depth, a capacity of 922 tons net and a lumber carrying capacity of 1,250,000 feet. Her first trip will be made from Eureka with a cargo of redwood lumber for Australia, and she will be in command of Captain Johnson. She is the fourth vessel built on the bay and at Bendixsen's yard this year. The schooner C. M. Kellogg, to be launched Saturday, will make the last for the year and the eighty-first vessel built at Bendixsen's shipyard.

SITUATED originally under nearly the same conditions as the Chili niter beds, the quality of the Nevada product some years ago averaged as high as 50 per cent, the maximum purity in a natural deposit. Now, however, it will barely produce five per cent, though some of the material found in crevices runs as high as 40 per cent. It has always been a question of interest to geologists and others as to the source of this niter in Nevada. The water in the Carson and Humboldt rivers contains a certain proportion of the salt, and the fertility of the sage brush lands of the State, when water is distributed over them, is said to be due to a liberal supply of the niter throughout the soil.

The tar springs in San Luis Obispo county are about nine or ten miles from Arroyo Grande, up the Valley road leading to Huasna, on Mr. Sanford's land. They have been leased to a Los Angeles company under the firm-name of 'Tar Springs Asphalt Company." The manager of the company is L. W. Johnson. The natural tar or asphaltum is prepared for market in two large furnaces. Over each of these furnances there are two large troughs or kettles of a capacity of about four tons each. Into these kettles the crude material is dumped from the wagons, and there it is put to boil and kept at a temperature of 280 degrees, Farenheit, for 48 hours, and is then removed from the kettles as fast as the ore is purified by this heat, the pure mineral rising to the top and passing out of the kettle by means of a swinging pipe, which can be lowered to the level of the melted mineral in the kettle, the foreign substances, such as sand, clay, lime, etc., settling to the bottom of the kettle, and is thus separated from the pure asphaltum, which is conducted through said pipes into barrels and allowed to cool, in which state it is ready for shipment. The refuse from the furnaces is used for fuel. This company manufacture their own barrels and have quite an extensive cooper shop on the grounds. They are now working from fifteen to twenty men, and are thinking of increasing their force by more men and a greater output of manufactured material. There seems to be an inexhaustible supply of the raw material. Among other things, it is suitable for the manufacture of ink, black varnish and paints, as well as pipe-dip, roofing and paving; and in its refined state, to which this company brings the material and runs it into barrels, it can reach a wide market, since it will bear long-distance transportation.

Mining Briefs.

ORE pours into Denver, Col., at the rate of 25,000 cars per month.

AT the White Hills, Arizona, the principal work is being done through chloriding, leasing and a few contracts. The ore is in small veins, but very rich.

MINERS have reached Caliente from the Argua range of mountains, where they claim they have discovered a very rich mine. It is in the southern part of Inyo county.

THE North Bloomfield Mining Company has not resumed hydraulic operation under the decision of Judge Gilbert of the U. S. Circuit Court, but is perfecting its system of catchment reservoirs, and will start up next spring.

THE Sierra Valley *Leader* says that John Bassett lately found a very rich quartz ledge in the vicinity of Gold lake, which is two feet wide and assays $400 a ton. A two-foot ledge of one-eighth that value would be a good thing.

GREAT excitement prevails in Truxo, N. S., in consequence of the discovery of gold at the Caribou mines, worked by the Truxo Gold Mining Co. The present discovery is expected to turn out the richest gold mine ever opened in Canada.

SOME of the Placer county papers state that the Red Point mine on the Forest Hill divide has suspended operations. This is incorrect. The mine was closed for a few days only. It is owned by a French syndicate, which has a large investment in the property.

THE Governor of Nevada says, in an interview, that there is not a dividend-paying mine in the State of Nevada. "We will have to find higher grade ores or cease mining." He said that the present low price of silver is responsible for the depression in silver-mining.

JUST after the recent heavy rainstorm, one of the men employed on Mr. Detert's ranch—better known as the old Finn ranch—near Drytown, Amador Co., picked up a gold nugget weighing about 14 ounces, on the bank of the creek, near the dwelling house. The value of the nugget is something over $200.

IT is stated that the original locators of the new San Juan placers surveyed the placer fields into subdivisions and led people to believe that they were locating coal lands, a deposit of coking coal having been found. It was not until the syndicate had placed gold-mining machinery on the ground, instead of coal-mining machinery at the coalfields, that the ruse was discovered.

WITH silver at 83 cents per ounce and lead at $3.70 per 100 pounds, the Anchor mine, Park City, Utah, found it impossible to break even on its second-class ore and was compelled to lay off all men employed in those stopes. The draft has been expected for some weeks. This is the first serious draft which has occurred in that camp as a direct result of the present low price of lead and copper.

THE Rapid City *Journal* quotes William Franklin of the Keystone mine as saying that the prospects of the camp are exceedingly bright, and on the completion of the stampmill in course of construction by the St. Paul syndicate, which several months ago purchased the mine, the camp will at once become a hullion producer of no small magnitude, as its ore is the richest and it has the largest body of any mine in the southern Black Hills.

The San Juan Placers.

No very definite news has been received here this week concerning the new placer fields in Southern Utah. A dispatch from Denver says: "Thousands of people from Arizona, New Mexico, Southern Colorado and Utah are rushing into the new fields on the San Juan. Towns along the Denver and Rio Grande, both in Southern Colorado and New Mexico, are almost depopulated. Nearly 3000 people are already upon the scene, and the new diggings are said to have made prospectors wealthy in a day. It was for some time a matter of conjecture as to the exact location of these placer mines. Investigation makes them most accessible from Durango and Dolores. The distance from either of these points is less than 90 miles. It is rumored that the Denver and Rio Grande is already surveying a line, and tons of provisions are being continually forwarded. Nuggets of coarse gold have been received here ranging in weight from 10 to 15 ounces, and similar to those discovered in California Gulch at the time of the Leadville excitement.

Another dispatch, from Flagstaff, Arizona, says: The first man to return from the San Juan placers came in yesterday in the person of Fletcher Fairchild. The two firms of Lesser & Sawyer and Cass, Tufts & Co., both of Winslow, have men on claims from the mouth of the San Juan 38 miles up, covering up all that is valuable there. Fairchild went 75 miles farther up and thinks he has a better location than the Winslow parties, showing all the way from 10 to 150 colors to the pan, with a good sawmill 15 miles distant at which lumber can be procured at $12 per 1000. There are only 200 men in the San Juan valley all told, but a great many are on their way at present. It is thought there will be serious trouble when the old miners come in over the claims being held by hired men for the two Winslow firms. The new gold fields and their richness are still the most important topics discussed in this and the neighboring towns.

The richest dirt lies in the bed of the San Juan river, and a man can take out from $3 to $50 per day, and the average is $10 per day. The washing is all done with pans. There is no lumber in camp to make sluices and washers. The little lumber shipped there is not for sale, although it could be sold at fabulous prices. There are but few supplies in camp, although there are a good many wagon loads of provisions on their way now, but as it takes a loaded wagon about 15 days to make the trip one way, supplies will be short for some time to come Two restaurants and as many saloons were in operation ten days ago. The weather in the San Juan valley is cold at this season of the year. Snow falls in the valley, but does not remain, but there is plenty of it on the hills around."

The probability is, there is gold in the region, of course, and more or less has been taken out, but concerning most of the ground little is known. No large amounts of gold have been taken out, and little stock need be taken in the yarns about 10 and 15-ounce nuggets. A few nuggets of that size would grow rapidly in number, as any man knows who has had experience with new placer camps. Of course some thousands of men will rush off to this new camp, out of which number a few may be successful. But no credence should be given to the stories of rich placer fields 50 miles long in a region like this, where prospectors have worked off and on for several years. Did such an extensive field exist, it would have been found before this. There are doubtless paying claims, but the extent has probably been exaggerated.

California Wines in France.

At the last meeting of the California State Board of Trade the argument was advanced that the protective tariff duty should be removed from French wines, as a preliminary step toward opening up a market in France for California wines. It was stated that France annually imports from Spain about 300,000,000 gallons of wine for blending and other purposes. These are mostly cheap wines, which do not enter into competition with the better grade of the French product. It was claimed that, if the barriers to free trade between this country and France were removed, the latter would purchase a considerable part of its imported product from the United States, and, therefore, from California. Spain and France are in a commercial union, by which the wines of the former are admitted nearly free of duty, a very small revenue tax only being imposed.

About a year since France changed its revenue laws, adopting a high protective tariff, with provisions for reciprocal treaties with various countries—much the same in scope and purpose as the McKinley law, with the important distinction that the duties imposed are not advalorem. The former duties on wines were as follows:

Wine, from European countries.....4 fr. 50 c. per hectoliter.
Wine, from all other countries.....4 fr. 50 c. per hectoliter.
Alcohol and distilled liquors of all kinds.....30 fr. per hectoliter.
Liqueurs.....30 fr. per hectoliter.

A hectoliter is 26½ gallons, wine measure.

Present duties are:

Alcohol and distilled liquors of all kinds.....30 fr. per hectoliter.
Liqueurs.....30 fr. per hectoliter.
Wine from countries not in commercial union with France....1 franc and 50 centimes per hectoliter for each degree of alcohol up to 11°; and for each degree above 11°, 2 francs and 65 centimes.
Wines from countries in commercial union with France or with a special treaty.....70 centimes per hectoliter per degree of alcohol up to 11°; and 2 francs and 65 centimes for each degree above 11°.
Maximum duty: 1 franc 20 centimes per degree up to 11°, and 1 franc 65 centimes for each degree above 11°, alcohol.
Minimum duty: 70 centimes per degree up to 11°, and 1 franc 65 centimes for each degree above 11°, alcohol.

It will thus be seen that a sliding scale was fixed on imported wines, the effect of which was greatly to increase the duty on vinous exports from this State. The aggregate of shipments from this State to France is, under this tariff, about 200,000 gallons per year, an almost infinitesimal total.

Negotiations are now said to be in progress for the establisbment of reciprocal trade relations between the United States and France. Their exact nature is not a matter of public knowledge, but it is expected that, if concluded, California wines will be admitted on a minimum duty, and the standard French brands will have similar freedom of entry into this country; or, at least some important French product will escape the high protective tax. It is claimed that the United States will receive more than it gives, under this arrangement; that, in the American market, the French wines and the California wines have their distinct place, and that the consumption of either will not be materially effected by a change in the tariff. That is to say, the two wines are not, strictly speaking, competitors, and the French wines will not, by reason of cheapness or otherwise, drive the California wines from the field, or vice versa. Whether this be true or not, there is a serious movement to get some important modification of the rigid provisions of the French tariff against American wines, and to make similar concessions under the reciprocal provisions of the McKinley law. If the negotiations for a commercial union fail, it is likely that the agitation will be continued before a Democratic Congress, to make an absolute reduction of the tariff on wines to a revenue basis, in the expectation that response in kind will be made by France.

The Asbestos Industry.

Mining and Preparing the Product for Market.

Until 1897 Italy supplied nearly all the fibrous asbestos required by the world, but in that year a number of companies were formed to work the veins known to exist near Thetford and Black lake, in the Province of Quebec, Canada. Since then, owing to the constantly extended use of woven asbestos,, the working of this mineral has become of considerable importance. According to the official statistics of the Canadian geological survey, the value of the asbestos in Canada in 1891 was $1,000,000, being exceeded only by that of coal, nickel, copper and petroleum. This industry is now in the bands of two incorporated companies, having an authorized capital of about $3,500,000, of which $2,125,000 are invested in the industry in Canada.

A paper on the "Canadian Asbestos Industry" was read before the General Mining Association of Quebec by L. A. Klein, A. M., of which an abstract is published in *Stone*. We republish this for the information of those owning asbestos deposits in California. Considerable quantities of this mineral are produced in this State, but there are many known deposits which are not worked. The description of the method of preparing the material for market will interest many miners here.

To prepare the asbestos for market two operations are necessary, viz., the mining proper and cobbing or separation of the ashestos from the adhering serpentine. At most of the mines the drilling is done by steam or compressed air, 45 feet of hole per day of 10 hours in the former case and 50 to 55 feet in the latter being considered a fair day's work, at an average cost of seven to eight cents per foot of hole drilled. At present there are in use seven compressors, with a total capacity of 44 drills, and there are 44 steam drills.

The average cost of drilling amounts to three and one-half cents per ton of rock broken.

Dualin, which contains 33 per cent nitroglycerin and costs 20 cents per pound, is the explosive used; it is fired by electricity. The expense for explosives is about three cents per ton of rock. The broken rock is roughly sorted in the pit, the waste rock being sent to the dump by wheelbarrows, or in the larger mines by derricks, and the crude asbestos to the cobbing-sheds. The cost of this averages 25 cents per ton of rock.

The second and most important part of the work is the dressing or cobbing of the ashestos and then grading it. This grading is generally done by band by boys. Some of the mines have, however, partially or entirely adopted machinery for this purpose, in order to avoid the loss of asbestos contained in the so-called cobbing-stone, *i. e.* large pieces of rock with a vein of asbestos in it, which did not separate by the blast and which can only he separated by heavy sledge-bammers, or by crushing.

The first to try to solve this problem was the Scottish-Canadian Asbestos Co. Their plant consisted of a Blake crusher, traveling picking tables, Cornish rolls, revolving screens, elevators, chokers and blowers.

THE ASBESTOS INDUSTRY.

The mines of this company were closed during 1888, and it was not until the winter of 1890–91 that the American Ashestos Company started to experiment in this direction, the main object being to do away with what is known as grade No. 2. At this plant the crude ashestos is conveyed by an inclined railway, and automatically dumped in front of a Blake crusher, the jaws of which are set at 1½ inches. The crushed ore drops on an inclined sieve in shaking motion, which separates all the loose fibre and the dust from the larger pieces of rock and asbestos veins, the former going directly to the cleaning or grading machines, the latter dropping on a revolving picking table, where the barren rock is removed by hand to one side of the table, the asbestos veins being left on the other. At the end of the table is a receiving chute which is divided into two compartments, and into which rock and ashestos are discharged respectively. The rock drops from the chute directly into a larry and is wheeled to the dumps, while the asbestos is conveyed either to the kilns, necessary in winter time or rainy weather, or to the fine crushers for further treatment. These latter are of unique construction, of which the object is to allow particles of a certain size and loosened fibre to go through, without being further crushed, as therehy the asbestos fibre is likely to be injured. This so reduced stuff is brought to the cleaning and grading machines, consisting mainly of a set of inclined sieves in rapid shaking motion in connection with blowers, fans, etc., while the remaining unbroken stone and unloosened fibre goes back to a set of still finer crushers to undergo the process again. The plant at King Brothers' mines in Thetford, which was principally erected for the extracting of asbestos out of large pieces of rock on the old dumps, which some years ago did not warrant the expenses for hlock-holing and further handling, consists of a Blake crusher, from which the stuff is conveyed on a set of Cornish rolls, with the intention of having all stone reduced to powder, from there to a revolving screen, of which the object was to screen out all the dust and leave the clean fibre. This object, however, has not been fully realized, owing to the failure of the rolls to break up the rock entirely, and an additional hlowing and screening plant has been put in, which produces now a very clean product of one grade,

The Anglo-Canadian also runs a crusher and a set of sieves, and the Johnson's company has recently put in a couple of crushers to overwork the old dumps. None of the processes at their present state, however, may as yet be considered complete, the main difficulties being two:

1. That, if asbestos is crushed with a considerable amount of stone, until the latter is reduced to powder—the long and most valuable asbestos is partially destroyed.
2. If the stone is not entirely reduced hefore grading it, is nearly impossible to free the fiber from the stone, and a large amount of waste is the result.

The cost of cobbing, according to Mr. Klein, varies considerably, according to the quality of material. While some asbestos will break from the stone very easy, other requires considerable labor; then larger veins will sooner be gathered than small ones. He places it, including the breaking of the cobbing-stones, at $7 per ton at the leading mines.

The asbestos after being graded, which is, however, in the entire discretion of every particular mine, is put in bags of 100 pounds each. Cost of bags is from 5 to 6 cents each; cost of bagging, 20 to 25 cents per ton. The cost for transport to cars and loading varies from 10 to 60 cents a ton, according to distance from railroad.

In estimating the cost per ton of asbestos, Mr. Klein says: "On this subject the opinions of the asbestos quarrymen are very different, and while some claim to mine only 50 or 60 tons of rock to the ton of asbestos, others go as high as 150. I am of the opinion that as a rule the quantity of rock mined to the ton of asbestos is greatly underestimated. Basing, on the capacity and actual work of our machinery appliances, the known quantity of larry loads removed from a mine during a year, and the known average weight of each load, in relation to the totals of asbestos produced, I hold that one ton of asbestos to 100 tons of rock is a fair average. If we accept this, the cost of production of asbestos may be set down as follows: Drilling, 3½ cents; blasting, 3 cents; labor for removing rock and gathering asbestos in the pits, 25 cents, making a total of 31½ cents to the ton of rock, or $31 50 to the ton of asbestos; $7 for cobbing; $1.50 for bags and hagging; 50 cents for loading; $5.50 for supplies, which includes fuel, tools, iron, steel, timber, other materials and repairs; $6 for general business expenses, such as management, insurance, offices, marketing and others; $3.55 ten per cent wear and tear, calculated nn a total of $355,000 in plant, making a total of $55.55 to produce one ton of asbestos. If we calculate now that we have to pay interest on a total invested capital of about two and one quarter millions of dollars, for which at least ten per cent must be expected, we bave in our sales to average a price of at least $80 per ton of asbestos."

The output of asbestos in 1880 was hut 380 tons, valued at $24,700. Since then the industry has steadily increased, with the only exception of 1888, and reached in 1890 8860 tons, with a value of $1,200,240. During the period between 1880 and 1890 the increase has been nearly 2600 per cent in toonage and 5100 per cent in value. Since 1880 the prices have been as follows: 1880, $65; 1881, $65 1882, $65; 1883, $72; 1884, $65; 1885, $58; 1886, $59 75; 1887, $49; 1888, $60; 1889, $69.75; 1890, $127; 1891, $111. During this time the imports of asbestos hv the United States have increased from $9786 in 1880 to $254,935 in 1890.

A Mark of Appreciation.

TO THE EDITOR:—Why should one not speak out his appreciation of men and their work, as well as criticise an article or process? Mr. Aaron's brief reminiscence was so happily worded, so quaintly clothed in pleasing allegory, that one can scarce help wishing to know more of the man, and especially one who possesses such rare devotion to bigh principle as to play the unknown knight in the manner told.

As Mr. Aaron says, the MINING AND SCIENTIFIC PRESS is more than a mere newspaper; it is in quite a high sense a public educator. Such being the case, I believe it would not he derogatory to the dignity of the paper to give a brief biography, or at least resumé, of the work of such men as Hanks, Aaron, Stetefeldt, Attwood and Paul, all of whose efforts have been to give the coast better processes, better views, and, moreover, an understanding that there is in mining a rare chance to use careful and scientific methods.

Why wait until a man is dead to speak well of him; to utter a few simple truths, when the same said in life would brighten the way and instill a little more "milk of human kindness," which would in turn reflect on those about, and all therehy be made happier.

I confess that I have sat at the feet and learned of one of the gentlemen named, have often called to my aid the bound publications of two more mentioned, and a thousand times felt indebted to all. I willingly admit that I am of a younger generation of chemists, but it will he with unfeigned regret that the voices will he "heard to cease" of those staunch old predecessors who have bequeathed us such a legacy of good example of devotion to "pure truth."

B.

A Proposed Topographical Survey of California.

An important movement for good maps has been making headway in this country in the last few years. Several of the Atlantic States have been completely surveyed.

It is proposed that California take up this movement on the Pacific coast. A plan is here submitted, modeled and improved upon that adopted in the eastern States, whereby a detailed general map of permanent value may be secured for the more valuable portions of California, through the agency of the topographical section of the U. S. Geological Survey, and at a cost that would be divided equally between the State and the National Government.

Maps of the kind here proposed are practically new to America. The Coast and Geodetic Survey has for many years persistently set the right example in its belt of topography along the seaboard, but over the great interior we have had until now only samples, with which the people are unacquainted. Maps in America, like our had roads, against which there has recently risen in the East such popular outcry, exhibit a striking crudity in contrast with European examples everywhere. We may be said practically to be without maps; and, because we have not had them, there has been no general recognition of the great importance of detailed general surveys to lightly settled regions like California, just beginning to introduce complexity into their engineering development.

The modern map is a contour topographical map, giving accurate measure of the relief of the surface, comparatively of great size, much too large for a wall map, and published in numbers of comparatively small sheets, each having about the proportions of a newspaper page. Massachusetts has 52 of these atlas sheets (so-called), which together cover its entire area. Joined, with the margins cut off, they would make a continuous map. They are bounded by quarter-degree lines of latitude and longitude, 15 minutes each way, covering a ground area, each, of about 240 square miles, varying slightly with the latitude. The scale is one inch to one mile. They show all the natural features of the ground, and all the artificial features of a public character.

Though these maps are many times larger than our ordinary wall maps of the States, and wholly different in character, they are, on the other hand, much smaller in scale than what may be termed engineers' plans. To extend such work as these engineers' plans over the area of a State would be magnificent, but it would not pay. In a country like California the cost would approximate too closely to the value of the land itself. Furthermore, as scale is increased the area that can be inspected at a glance rapidly diminishes, and comprehensiveness and general usefulness are lost in the multiplication of sheets of small areas. The modern topographical map is the engineers' plan in miniature—a map for general purposes; detailed and accurate to the limits of its scale; and long experience in Europe has fixed that scale at one inch to one mile.

The desirability of such a general atlas-sheet map for California may, in a general way, be indicated by an enumeration of advantages: (1) It would afford a uniform base for the record and comparison of statistical facts, and for the illustration of a country's products. (2) It would serve for the preliminary planning of public works, such as the selection of routes for either roads, railroads, or canals, by exhibiting all the possibilities and impossibilities for the special undertaking in hand, in a general way, thus obviating the necessity for many trial surveys, and suggesting possibilities that the trial survey might not discover. (3) It would aid in the proper understanding and just solution of many perplexing controversies, such as that between the hydraulic miners and the agriculturists. (4) It would prevent the development of radical mistakes in complex systems of irrigation, which might eventually necessitate expensive remodeling. (5) It would serve as a base for the rapid, easy, and accurate production of agricultural product and soil maps, and for the study of the bearing of altitude (irrespective of soil quality) upon horticultural products. (6) It would simplify and facilitate the solution of our forestry problems that are rapidly growing in intricacy and importance. (7) It would aid in the planning of better highways for the readier transportation of farm products. (8) It would greatly stimulate scientific research. (9) It would facilitate travel for business, and would encourage and enhance the interest of travel for pleasure. (10) As our last war abundantly demonstrated, it would vastly simplify military operations; and, finally (11), it would have a high educational value, important, yet as difficult to define as the importance of culture in general.

For a hundred years European countries have been struggling with the map problem, so important is it considered to be. The chief difficulty has been with the question of scale. That question is now generally decided in favor of about one inch to one mile. Present results have been achieved at vast expense, though an expense many times greater than that at which they could now be duplicated. We can benefit by this costly experience; and, if to densely populated Europe good general maps are a desideratum, how much more desirable must they be for a State almost at the beginning of its settlement.

To bring it about that California shall take up, on the Pacific coast, this movement for good maps, if desirable and practicable, a number of committees, representing the University of California, the Leland Stanford Jr. University, the Technical Society, and the Academy of Sciences, have together held a series of meetings.

Their work has been as follows: (1) Examination into the needs of California; (2) inquiry as to what work of similar character has been done in eastern States; (3) correspondence with the director of the U. S. Geological Survey, and with the superintendent of the U. S. Coast and Geodetic Survey; (4) personal conference with the director of the U. S. Geological Survey in regard to the practicability, and the terms, of a possible cooperative undertaking between that Bureau and this State; (5) examination, in the field, by certain members of the committee, of similar work now in progress by the Geological Survey near San Francisco, and examination, by the full committee, of recently finished sheets of that work; and (6) the careful preparation of specifications for the proposed work, agreement to which has been obtained from the Geological Survey.

These specifications are as follows:

1. That the map be a complete contour topographical map, based upon triangulation and leveling, and constructed by plane-table survey, showing, in addition to the natural features, (1) all existing monuments of township and land-grant corners; (2) all railways, canals and public distributing ditches; (3) all public roads, and all other roads in unrestricted use, and therefore virtually public; (4) all county boundaries; (5) all cities, towns, villages, hamlets, prominent mines, and other important places, with indication of their buildings, together with all isolated dwellings and public buildings outside of town limits.

2. That in each township at least one permanent bench mark be made, with record of the precise altitude above mean sea-level.

3. That all contours be on a scheme involving intervals of five feet or multiples of five feet, according to the slope of the ground, and that the contour interval be uniformly five feet wherever the slope of the ground is less than 15 feet to the mile, in which case contours will be traced out by actual leveling.

4. That all navigable streams and important watercourses be located by continuous survey of their banks.

5. That salt-marsh land and fresh water swamp-land be distinguished by distinct conventions, and that there be indicated for the boundaries of the same the natural limits, not the legal segregation limits.

6. That there be at least three triangulation points to each plane-table sheet.

7. That the field-scale be not less than one and one-third inches to a mile, or three-quarters of a mile to an inch.

8. That the publication scale be one inch to one mile.

9. That the size of the atlas sheets be that of a quarter-degree square, limited by the even 15-minute lines of latitude and longitude.

10. That the U. S. Coast and Geodetic Surveys be requested to contribute as many triangulation points as possible.

11. That the headquarters for the survey be in California.

12. That the work be done by the U. S. Geological Survey, under supervision of a commission of five persons representing the interests of California, of whom four shall be appointed by the Governor, one to be a representative of the agricultural interests of the State, one a representative of the mining interests, one on nomination of the State University, and one on nomination of the Leland Stanford Jr. University; and of whom the fifth commissioner shall be chosen by the others so appointed.

13. That the expense of the survey be divided equally between the State and Federal authorities.

14. That the U. S. Geological Survey engrave the copperplates for all the map sheets wholly at its own expense, and that it own the plates, and that the State of California have the privilege of taking electrotype transfers from each and all of such plates for its own use.

The preparation of such a map would necessarily be a work of years. Each atlas sheet, however, corresponding in area to about 6½ townships would in itself be a complete map, independently surveyed, engraved and published. Interruption or termination of the work at any stage, therefore, would not affect the value of what had already been accomplished.

It is not recommended that the work be planned to eventually cover the entire State; the Geological Survey is now engaged independently on a similar survey, on the smaller scale of one inch to two miles, of the Sierras, and may eventually map all of the mountainous regions. It is suggested rather that the aim should be to survey the more valuable areas of the State only—the habitable areas and the otherwise economically important areas—and that beginning should be made simultaneously from several of the more thickly-settled centers.

It is believed that the best interests of the work would not demand a larger expenditure than $50,000 annually. By the terms of the proposed arrangement with the U. S. Geological Survey, one-half of this annual expense would be borne by that Bureau. The cost of surveying the atlas sheets would average about $3000 each, and it is thought that the annual product of the survey would be from 15 to 20 of these sheets. The cost of engraving would not have to be shared by the State. The cost of electrotyping and printing from time to time could be more than covered to the State treasury by selling the sheets at a uniform cost of ten cents each.

It is thought that to survey in this manner the whole of the valleys and foothill areas of the State, together with a small percentage of the more important mountain areas, would take ten years of time and call for a total expenditure by the State of $250,000. Presumably the rate of progress might later with safety be considerably increased and completion of the work hastened; also, it is recognized that, as the work progresses, it might be found desirable to increase its extent.

The atlas sheets for the valley and foothill areas, with liberal construction of the term foothill, would number from 150 to 200. The total number of similar sheets of the Massachusetts survey was 52, and of the Rhode Island, the Connecticut and the New Jersey surveys, each proportionately less, but for the State of New York, which last year made its first appropriation toward a plan almost identical with that here proposed for California, the total number of sheets will be something more than 200.

By increasing the scale to that of the engineers' plan, the cost would be increased enormously and the number of atlas sheets multiplied to many thousands.

Upon the joint agreement of the committee and the director of the Geological Survey to the foregoing specifications, the committee unanimously indorsed the above-outlined plan for a topographical survey, and herewith begs to submit that plan, with its favorable recommendation, to the people of the State.

JOINT COMMITTEE.

Joseph Le Conte, Chairman; Andrew C. Lawson, Secretary.

For the University of California—
E. W. Hilgard, Professor of Agriculture.
F. Soulé, Professor of Civil Engineering.
S. B. Christy, Professor of Mining and Metallurgy.
Andrew C. Lawson, Associate Professor of Mineralogy and Geology.

For the Technical Society—
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W. G. Curtis, C. E.
H. Vischer, C. E.

For the Leland Stanford, Jr., University—
J. C. Branner, Professor of Geology.
C. D. Marks, Professor of Civil Engineering.
G. M. Stillman, Professor of Chemistry.

For the Academy of Sciences—
H. W. Harkness, President.
F. Scupham.
T. S. Brandegee.

For the Science Association of the University of California—
Joseph Le Conte, President.
E. Greene.
W. E. Ritter.

Asphaltic and Bituminous Products.

We have received from Mr. Leon Malo, consulting engineer, of Seyssel, France, an article on the "Nomenclature of Asphaltic and Bituminous Products," in which he urges that, to avoid confusion of terms, he adopted a nomenclature 25 years ago, to which no objections were made until 1888, when Capt. F. V. Greene, in a paper before the American Institute of Mining Engineers, read at Buffalo, N. Y., objected to Mr. Malo's use of the word asphalt to designate a natural combination of bitumen and limestone only. Mr. Malo's article, it should be added, was translated by Mr. W. H. Delano, Paris.

Mr. Malo classifies bitumen, according to its combination with other metals, as follows:

(1) When bitumen impregnates limestone by a natural process the product is asphalt. (2) When bitumen agglomerates quartzous or quartzo-calcareous sand, the product is bituminous sand. (3) When it is mixed with clay the product is Trinidad Lake pitch. (4) When mixed with bituminous limestone (*i. e.*, asphalt), melted and run into blocks, such as are used for sidewalks, the product is bituminous mastic."

Mr. E. P. North, M. Am. Soc. C. E., in a paper on "Construction and Maintenance of Roads," read before the American Society of Civil Engineers, April 16, 1879, and since published in the book entitled "Road-Making and Maintenance," says that asphalt and bitumen have been used as interchangeable terms by dictionary makers and chemists. He then gives definitions of these words and of asphaltic mastic by Mr. Malo, as follows:

Asphalt; bituminous limestone.

Bitumen; the black and viscid substance which we find disseminated in the pores of bituminous limestone and in the interstices of the "molasses" of Seyssel or the sands of Auvergne.

Asphaltic mastic; bituminous limestone transformed by dressing and by the addition of a small quantity of bitumen.

Mr. North states that "it is believed" the above definitions have been generally accepted in Europe, and employs the words with the same meaning in his paper, with the exception that the bitumens from Trinidad and Cuba are included. To cover American practice, Mr. North added the following definition:

Bituminous Mastics.—Mixtures of bitumen, either having an earthy "gangue," like those of Trinidad and Cuba, or purer ones, like grahamite and albertite, with limestone or other substances not naturally impregnated which add to its resistance to wear.

The facts of the case seem to be says the *Engineering News*, that Mr. Malo's restriction of the word asphalt to designate bituminous limestone, or natural-rock asphalt, answered very well in Europe, where bituminous limestone was chiefly used, but in this country we have not found it convenient or in any way desirable to restrict a word of universal application to the bituminous products of one locality. It is not easy to see why bitumen naturally combined with limestone should be called asphalt, while the same material in larger proportions combined with alumina and silica, oxide of iron and lime, the chief mineral components of the Trinidad product, should be called Trinidad Lake pitch. In its earliest use the term asphalt was applied to the bituminous matter itself, and not to a combination of this with any other mineral. From this point of view, the Trinidad product, far more than that of Seyssel or Val de Travers, is worthy of the name asphalt, since it contains about four times as much bitumen. Natural asphalt sandstone rock is now found in California (*Engineering News*, Jan. 8, 1887, Nov. 30, 1889), so any claim to the exclusive use of the term asphalt to the bituminous limestone of France or Switzerland because this is more nearly ready to be put into pavements, is not now, if ever, valid.

The word asphalt in various forms is found in the Greek, Latin, Italian, French, Spanish, Provencal and Middle English languages. It is of undetermined foreign origin, but has been employed from the earliest times to designate bituminous products used as cements.

The Century Dictionary defines "asphalt" as nearly synonymous with "bitumen." We see no reason for questioning the propriety of this definition, nor for attempting to restrict the single word "asphalt" to what is now generally described as "natural-rock asphalt." Certainly this is not now the popular meaning attached to the word. Every one thinks he has some idea of what "asphalt" is, and yet a majority, perhaps, of intelligent men who are not engineers do not know even that there is such a thing as natural-rock asphalt, having rarely or never seen the rock itself.

Mechanical Progress.

How Needles Are Made.

Needles are manufactured out of superior quality of cast-steel wire cut into lengths to make two at a time. Pieces are straightened upon an iron table by means of an instrument termed a "rubbing knife." The wire is then pointed by automatic machinery provided with a fan or shaft to carry away the steel and grindstone dust, which is very injurious to inhale. In former days the lives of workmen employed in the needle trade were considerably shortened by breathing air charged with particles. Indeed, the following is a narrative told by a doctor in the district of the industry concerning a patient, a hand needle-pointer by trade, who complained that he felt a hard ball of something in his trachea, which rose and fell between his chest and throat. The doctor ridiculed the idea and told him it was nonsense, hut the man still persisted it was there, and asked him if he died to examine him. After the poor fellow's death a post mortem examinatlon was made and resulted in a solid mass of steel and stone dust about the size of a bird's egg being found, as he had said, in his throat, and the lungs were so encrusted with steel that a knife would scarcely pierce them. It was therefore truly a blessing to these busy workmen when this deadly process was done away with, and in its stead a healthy one substituted.

After the operation of pointing, the wires are stamped and then pierced to form the eyes. As the diameters of the wires used in this industry are usually very small *e. g.* .03 of an inch, it will be readily apparent that the above process involves considerable accuracy and skill. The "burrs" produced by stamping are afterward removed by means of flat grindstones called filing machines. A "spit" of these double needles is next placed between a hand vise, termed "clams," and divided into single ones, requiring only to have their heads "rounded" by filing to furnish the complete articles.

A finished needle, however, must have a hard and elastic temper, whereas these, in their present state, are softer than the wire out of which they were made. Therefore, after the needles have been burnished in the eyes, they are hardened by heating in an oven, and subsequently cooled by plunging them into oil. This rapid cooling of the steel makes it as brittle as glass. The needles will now almost break upon touching them, indeed, in this condition they would be as useless as in the soft state. To reduce them to a perfect state of elasticity, temperature has to be again raised about 600 degrees, and then by allowing them to cool gradually the required degree of elasticity is obtained. During the process of hardening, the fire makes many of the needles crooked and these have to be picked out and straightened by a small hammer, one at a time, on an anvil. The heads are afterward softened by the application of heat for facilitating burnishing. The process of scouring the needles bright takes about a week. They are mixed with oil, soft soap and emery powder, wrapped in loose canvas, and placed in a kind of mangle worked by mechanical power. This scouring process done, the needles are washed in hot water and dried in sawdust.

The points, slightly blunted by passing through the various processes described, are now set upon a small revolving grindstone and the eyes reburnished. The next operation is that of polishing the needles, and which is performed by a rapidly rotating wheel covered with prepared leather. The needles are caused to pass many times over the leather in order to thoroughly polish them. Finally they are counted and stuck by women into cloth, wrapped in paper, and labeled for the market. — Chicago Journal of Commerce.

GETTING IT DOWN FINE IN SCREW MANUFACTURE.—An instance of remarkably fine mechanical work is that described by Prof. Rowland, the distinguished microscopist, says an exchange, who has now succeeded in manufacturing a screw for his dividing engine which is said to be more nearly perfect than any other of tbe kind ever produced. It is made of the best steel, is 1½ inches in diameter, 17 inches long, and with 20 threads per inch; was first cut in a lathe in the ordinary manner, then ground by using a nut equal to it in length, which was placed on it with washed emery, and the screw revolved under a bath of water and oil maintained at a constant temperature. The grinding required about three weeks. It is to be used mainly in ruling gratings for spectroscopes, and it is thought will be capable of ruling a million of lines to an inch. In the head attached to the screw there are a thousand notches, so that the movement of a notch advances the thread 1–20,000 of an inch. It may be remarked that M. Behrens has lately stated to the Amsterdam Academy of Sciences that, under high powers of the microscope, the network in hardened steel may be made visible on polished slices without etching or annealing, the dark, sinuous lines answering to the bright ones shown by Sorby on etched slices, and it is proved that hardened steel contains hard granules bound up in a matrix of soft iron.

The Care of Gas Engines.

The increased use of gas engines, remarks the *Engineering Record*, and the wide range of work to which they are now applied, make the following notes on their care of considerable value. These hints have been taken from a variety of sources, and relate to tube-ignition engines alone. In this type, the tube itself should he carefully looked after, since several charges may he drawn into the cylinder without any explosion, if it is in bad condition. Sometimes an engine refuses to start, and in such a case it will often be found that the tube is enlarged and covered with scale. It should be carefully removed as soon as it is seen to be in this state, care being taken that none of the scale gets into the passage leading to the cylinder. There is no necessity for heating these tubes to anything near a white heat, and they are apt to cause much trouble at such a temperature. If the tube will not heat, the trouble may be due to the Bunsen burner or to draughts. Tubes of a special alloy are being put on the market by the Otto Gas Engine Works, which will not deteriorate rapidly (their lifetime exceeding one year) and thus avoid many of the troubles mentioned.

Most engineers are accustomed to at once attribute loss in compression to the valves, but this can be easily determined by turning the flywheel. If very little compression is felt, the trouble is probably due to dust and grit getting between the valve and its seat, or to the sticking of the valve-spindle in its gland. In the first case the grit can he removed by turning the valve around a few times, so as to grind the dust away. If the valves stick, a little *coal* oil is to be poured on the spindle, which is to be worked sharply back and forth until the springs will bring it down on its seat in the proper manner.

The springs are also apt to become weak and should then be at once replaced. A small loss in compression is quite important, since the power developed by the explosion depends considerably on the density of the mixture, and it has been found that the lower the amount of compression the richer must he the mixture in order to have good ignition.

After an engine has been knocked down for removal or repairs, and is then again set up, care should be taken that the cams working the valves are set in the place they formerly had. If the teeth on the wheel of the crankshaft are set forward on the wheel keyed to the camshaft, the exhaust valve will be opened too soon and part of the force of the explosion be allowed to waste up the exhaust pipeshaft. If the wheels are set a tooth or two backward, the explosive mixture will he forced into the airbox, with results that may be extremely unpleasant in some style of engines.

Joints and packings in gas engines should give no trouble when the right material is used. They will give out and need replacing only, when cooling water is not turned on for a considerable length of time. For all joints exposed to the inner heat of engine, especially near the exhaust valve, asbestos board is used, and between the cylinder-head and cylinder the same material, but of slight thickness, will answer. Any attempts to use rubber-packing will result in failure after a short run. Rubber-packing may be used only on outer joints against water, where water-jackets are castings independent of the cylinder. Leaks of inner joints are generally detected by an accumulation of water overnight inside of the cylinder. There is no trouble in detecting leaks outside of the cylinder, and there is no loss of power from such source.

THE power plant at the World's Fair is to be made up of all the principal American makes of boilers, engines and dynamos, the units being of all sizes up to 1000-horse power. While such a plant is a necessity to the Exposition, the idea has been at the same time to show as many different types of machinery as possible in actual operation, and manufacturers have been only too glad to take advantage of this opportunity to display their apparatus. The designs call for the delivery of over 30,000-horsepower in steam, which gives some idea of the size of this power-distribution station.

Scientific Progress.

Cholera and Ozone.

The fact that electricity enables ozone to be generated cheaply and on a large scale, says the *Electrical World*, may have a most important bearing in the future as a sanitary measure, more particularly, however, in relation to cholera epidemics. That some connection exists between the spread of cholera and the scarcity of ozone in the atmosphere there appears to be little doubt, from observations begun as early as 1884 and continued ever since. There is a normal amount of ozone in the atmosphere, and it appears from these observations that at places where the cholera existed the amount of ozone in the atmosphere was below this normal, sometimes even to a very marked degree. Moreover, an increase in the epidemic in certain localities seemed to go hand in hand with a diminution of the amount of ozone in the air. During the early part of the 1884 epidemic in Paris and Marseilles the quantity of ozone in the air was found to be decidedly below the normal. This itself would point to some connection between the two, but an additional fact of great importance is that tests made at the same time in other places which were free from the epidemic showed the presence of a normal amount of ozone. Tests made since by numerous observers appear to have confirmed this coincidence. The fact that some relation may exist between the two would not be surprising, as cholera, we believe, is now recognized as a germ disease, and ozone is well known to be a very effective germicide. It is, moreover, an excellent means to use, because if properly made it is not in the least injurious to human beings. When made by chemical processes or from oxygen, it may be injurious, but this is owing to impurities or to the presence of untransformed oxygen. If, however, it is made of air ozonized by means of electricity it has been found to be quite uninjurious. Mr. P. de Puyt recently made some very interesting and instructive compilations regarding this matter, and urges very strongly the use of ozonized air, not only as a destroyer of germs in hospitals, lazarettos, schools, public houses, and other places, but also as a preventive in the case of a threatened epidemic. Eleven to twelve centigrammes per litre of air, which is easily produced by electrical means, and was formerly claimed to be a dangerously large quantity, he says has been found to be perfectly harmless even for infants, if made by electrical means. He also compiled the following interesting figures: During the month of July, 1884, while the cholera epidemic was at its worst in Marseilles, the mean quantity of ozone in the air was .86 as compared to 2.17 during 1883. In Paris even greater difference was found. During the maximum period of the epidemic in November, 1884, it was .44 as compared to 1.82 for the same period in 1883. Moreover, during the two weeks when the mortality was greatest the amount of ozone in the air was as low as .27 as compared to 2.0 for the same period in 1883. Furthermore, during several days when the air was charged electrically, more than was usual, the epidemic was found to diminish in its severity. Such coincidences are certainly very striking and warrant the most careful attention and study on the part of physicians and boards of health. There is time now before the threatened cholera epidemic in this country next summer to institute experiments and make preparation.

Volatilizing Quartz.

Dr. Segar, a German chemist, reports the following trial at volatilizing quartz: The furnace employed was what is known as the Deville pattern, and consisted of a single cylindrical sheet-iron case lined with dead-hurnt magnesite, having an internal cavity of about 5 inches in diameter and 11 inches high. The magnesite lining only extended about two-thirds the length of the cylindrical casing, which was divided at that point by a perforated iron plate, forming the floor of the furnace proper, and supporting the crucible. Below this division was the air-chamber, into which a blast was injected by a side opening, and which served for the preliminary warming of the air before it came in contact with the burning fuel. The crucible was of carbon, and was inclosed in another of magnesite. The fuel used was retort carbon, and was kindled by a few fragments of burning charcoal. The quantity of the former used was 4 kilogrammes, which is certainly a very moderate expenditure. After the experiment it was found that the quartz had undergone fusion, to judge by its appearance, and was noticeably smaller. When weighed it was found to have been reduced to the extent of over 40 per cent, the total mass taken being about 2.5 grammes, and the quantity that had disappeared amounting to 1.1 gramme. That this was in no sense due to accident was proved hy repeating the experiment with another piece of quartz, with a precisely similar result. The comparative constancy of the loss might lead to the supposition that there was some limiting factor in the volatilization, but a second heating of the same testpiece caused a further loss of about 15 per cent on the original weight, and on repeating the heating twice the piece of quartz vanished altogether. It was observed in the course of the experiments that when the quartz was cooled rapidly it had an opaque porcelain-like aspect, while when the cooling took place gradually the testpiece was perfectly transparent.

Structure of the Eye.

That the structure of the eye suggests comparison with a photographic camera is an exceedingly trite observation. The "sensitiveness," as it were, of the retinal "plate" is determined, other things being equal, by what is commonly called acuteness of vision. And it may he remarked, in this connection, that there must be a definite "length of exposure" necessary for the impressment of the retinal image upon the mind. The true optical exposure may, of course, be an exceedingly short one, but there is the retinal—probably retinal, but possibly, in part, cerebral—persistence of action analogous to phosphorescence, to be reckoned with, and we should like to know to what extent the effect of this upon the brain is cumulative.

Every one knows hy experience that it is impossible for the mind to obtain a passing glimpse even of one out of a train of very rapidly successive images upon the retina. But it is also known, as we have just remarked, that a most exceedingly short retinal exposure is sufficient, provided that the subsequent "persistence" is not interfered with. A simple experiment to estimate the relative importance of optical exposure and of "persistence," in regard to the production of cerebral action, would he to suddenly extinguish the light while observing a zoetropic succession of images.

It is complained, and we think with reason, that the properties of the retina, regarded as a photographic surface, have not been sufficiently investigated, and that the records of such experiments, as have been tried, are not very accessible. The question whether the excitation, active or merely persistent, of one color sense is favorable or otherwise to the sensitiveness of the other color senses, has been recently asked. So, too, the question how the period of persistence varies with the quantity and quality of light; what facts can be discovered by photographic retinoscopy; whether problems relating to the color senses, and the extent to which "persistence" is accompanied by surface phosphorescence, could not be most accurately determined by photographing retinal images? The suggestion to study the eye photographically is, in our opinion, worthy of attention. Actinic illumination or images would have the advantage of not irritating the eye or causing contraction of the pupil. The only doubt we entertain is as to the sufficient transparency to actinism of the substance of the eye.—Optician.

How the Lucifer Match was Invented.

It is not generally known that it is to Isaac Holden, M. P., that we owe the invention of the lucifer match. The discovery was, he has told us himself, the result of a happy thought. In the morning, I used to get up at four o'clock in order to pursue my studies, and I used at that time the flint and steel, in the use of which I found very great inconvenience. Of course I knew, as other chemists did, the explosive material that was necessary in order to produce instantaneous light, but it was very difficult to obtain a light on wood by that explosive material, and the idea occurred to me to put sulphur under the explosive mixture. I did that and showed it in my next lecture on chemistry, a course of which I was delivering at a large academy. There was, said Mr. Holden, a young man in the room, whose father was a chemist in London, and he immediately wrote to his father about it, and shortly afterward lucifer matches were issued to the world. I believe that was the first occasion that we had the lucifer match. I was urged to go and take out a patent immediately, but I thought it was so small a matter and it cost me so little labor that I did not think it proper to go and get a patent, otherwise I have no doubt it would have been very profitable.—Pall Mall Gazette.

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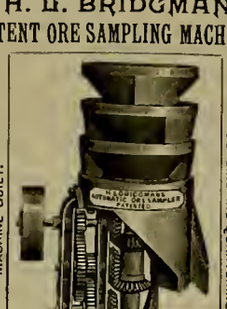

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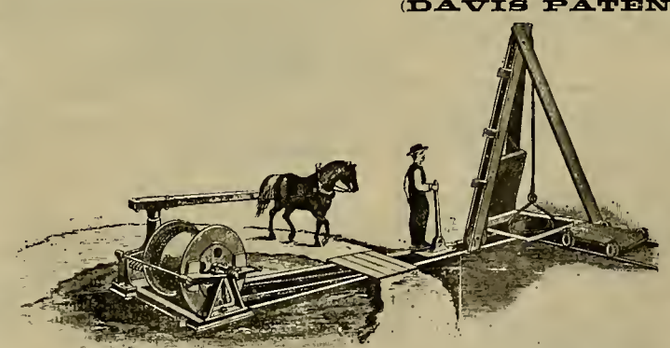

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Electricity.

History of Electric Street Railways.

The history of electric street railways for the last five years is that of almost unequaled development. The figures showing the growth of the system are interesting. At the close of last year there were in this country 10 599 miles of street railway, with 55,877 cars; 4661 miles were electric. The total of horse, cable and electric cars had increased during the year 3826 cars. Of this number 3300 were propelled by electricity. There were at the end of the year seven times as many miles of electric roads as of cable, and almost twice as many electric cars as there were cable cars. There were at the end of the year something over 400 electric roads in operation in America. Last March it was estimated that of the 16 cities in the United States having over 200,000 inhabitants, 14, or 87 per cent, were equipped with electric roads. Of the 42 cities having between 50,000 and 200 000 inhabitants, 41, or 97½ per cent, had electric roads. Of the remaining 391 cities with a population of over 8000, it is said that there are not a score that have not electric roads, or are not preparing to introduce the system. Since March every one of the larger cities referred to as the exceptions in the above percentages has fallen into line with the formal approval of this comparatively new method of rapid transit. The investment to date is said to reach over $100,000,000.

In spite of this very general adoption of the electric system of transit throughout the country, the advocates of the trolley are obliged to confess that there is only one road in operation—that in Washington—which is properly equipped. In large cities, they say, one condition should be insisted upon when franchises are granted by the authorities, and that, if this condition is complied with, much of the objection to an overhead system would disappear. The company holding the franchise should be compelled to make the construction of the very best. It is declared that the only overhead wire necessary is the contact wire, which need not be more than one third of an inch in diameter; that the main conductors and feeders should be put underground, in proper conduits. In broad streets, where the tracks occupy only a small portion of the street, and are near together, a line of poles, ornamental in design, as is the case in Washington, and not less than 150 feet apart, and with arms projecting on either side, could follow the center of the street, and could be utilized for electric lighting.

But, as the roads are usually constructed, the popular objection to the overhead system is by no means without reason, since it is dangerous to life and property, and an eye-sore which is only equaled by the elevated road structures in New York City. Corporations are proverbially "soulless," and when they see an opportunity of cutting down their operating expenses from 30 to 50 per cent, they are not likely to develop sufficient conscience to resist the temptation, so long as they are granted the privileges which they ask or demand without having the slightest restrictions placed upon their actions.—*Harper's Weekly.*

SEARCH LIGHT.—The search light to be used at the World's Fair is a great thing. It is perched on the tower of the Transportation building, and is the largest and strongest one in the world. It was made at Nuremberg, Germany. The great magnifying glass, through which the rays are thrown, is four feet in diameter. The direct power of the light is 15,000 candles without any glass. With the big glass, however, the power is magnified to 160 000,000 candle power. The carbons used in the radiator are 12 inches long and one and one-fourth in diameter. They are fastened inside the lamp merely with two upright pieces of steel. The lamp itself is operated on a sort of carriage, something after the manner of a Maxim gun. It can be turned in any direction, and can be tilted so that the ray will ascend straight up. When the full power of the light was turned on, the city of Chicago could be viewed distinctly, though the night was anything but clear. Prof. Tischendoerfer claims that on a perfectly clear night Michigan City, across the lake, would be perfectly visible. He also claims that on such a night the rays from the lamp could be seen by persons 60 miles away.

ELECTRIC RAILWAYS.—As a matter of statistics, it would appear that electricity is running about 500 street railways in the United States and Canada, a gain of nearly 200 in two years, and fully equal to half of the total street railway system of America. The investment in these roads has passed the $200,000,000 mark, but gives no sign of falling off to a lower rate of increase, for it was only in February, 1891, that the investment was estimated at $50,000,000. These roads are operating at least 12,000 cars, or two to every mile of track. These are wonderful figures of growth since 1887, when the first American electric railway statistics could present only the slim total of 13 roads, some of which were in reality mere experimental stretches of track with but a couple of cars on them.

Electric Wire Regulations in Paris.

The new regulations issued by the municipality of Paris, governing the laying of wires of private electric companies, entirely prohibit, says the *Engineering News*, the placing of such wires in sewers or other underground conduits located between the curbs, and demand the laying of such wires under the sidewalks. The materials used in the conduits must be approved by the proper municipal officers, who are also to specify the position, exterior diameter and required depth of the conduits. The most favorable positions, near the surface of the streets, are reserved for the municipal electric-light conduits. In order to avoid crossing streets to make house connections, a conduit must be carried under the sidewalk on both sides of the street except in very narrow streets. Whenever a conduit crosses a street, it is to be made accessible by a manhole on one side. In very important thoroughfares each side must be furnished with a manhole. If several companies are laying wires in the same street, a common conduit must be employed, the accruing costs to be shared equally between them.

Electric wires of private companies are not to be carried closer than 3.28 feet to the front walls of houses, which space is to be reserved for the laying of municipal wires. The connections are to be carried in conduits of smaller diameter to the limits of the house. Other branches from the conduits and transformers are to be placed outside the street.

The application for a permit for laying electric wires must be accompanied by detailed plans, for the preparation of which the municipal records and plans of sewers, water conduits, etc., may be consulted. The general plan, drawn to a scale of 1·1000, must show the proposed conduits, with house connections and the number of lamps. The amount of power to be supplied, the position and material of the cables and the size and material of the proposed conduits must be specified. The details must be shown on a scale of 1 in 20 to 1 in 50. Before the pavement is disturbed, the company must pay the city for the proper relaying of the pavement at the following rates per sq. meter: Macadam, $0.56; asphalt, $3.00; wood, $3 80; flagging, $0.95.

Foundations are charged extra at $0.75 per sq. m. for sand and $1.50 for concrete. Curbing is charged at $1.29 per lin. m. (39 cts. per ft.)

TANNING.—The recent application of electricity to tanning in France has resulted in reducing the time of tanning oxhide from 16 to 18 months in pit tanning, and from five to six months in liquor tanning, to 96 hours in both cases, and also does away with continuous hand labor and the disagreeable odor so characteristic of tanneries. Electricity seems in some unaccountable way to accelerate the absorption of the tannin by the hide. The invention without doubt marks one of the most important advances in technology made in many years.

JAPAN is making rapid progress in various lines, and the natural ingenuity of the people is making itself felt even in the electric field. A Japanese has invented an electrical device for recording the votes cast by the members of the native parliament. Each member has a push button and a wire locked with his own key. An electric current releases a red ball, according to contact, in two directions, and when the names are noted the balls are run into rows of 10 and counted up. By an ingenious electrical device the balls are then sent back to their places.

GEORGE WESTINGHOUSE sets the cost of a powerful passenger locomotive of 1200 horsepower at $10,000. To do the same work by electricity would require a 1600-horsepower steam plant and electrical apparatus costing $81,000. It is easy to know where he stands on the question of abandoning the iron for the copper horse on our long trunk roads.

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Manufacture of Alum in India.

In a recent issue of the Indian Engineer attention is drawn to the manufacture of alum at Kalabagh, on the Indus, at the westernend of the salt range in the Punjab. The works are owned and superintended by a native khan, and as the expenses are small the profits are very considerable. The process of manufacture is divided into five stages: (a), burning the shale; (b), extracting the soluble matter from the burnt shale; (c), boiling it with salts of soda and potassium; (d), crystallizing the impure alum; (e), heating in earthen pots and recrystallizing. In the first stage the black alum shales, composed of clay and iron pyrites, are brought by coolies to the works, where they are broken up into lumps about five inches square.

These lumps and brushwood are placed in alternate layers of about one foot thick, and when the heap is about 15 feet high it is ignited from below. As the pile burns and sinks down, more layers of brushwood and shale are added. After burning for about six months, the mass is allowed to become cold. The shale has become a bright red color, due to the oxidation of the iron, and is very friable. In the next stage the burnt clay is thrown into square earthen vats about 10 feet long and two feet deep. Water is then slowly added until its level is nearly up to that of the shale. The soaked portion of the shale is raked down a little at a time into that part of the vat containing the water, with which it is thoroughly mixed; it is afterward taken out with a perforated shovel.

The water containing a soluble part of the burnt shale is, after a time drawn off into a similar vat, and any red solid suspended matter is allowed to settle. It is afterward drawn off into a shallow circular vat about 10 feet diameter, made of plates of sheet iron riveted together. The solution is then boiled with an impure sodium and potassium salt called *jamsan*, obtained from *reh*—the sodium sulphate and carbonate efflorescence so commonly found in the Punjab. The liquid, after further boiling is decanted and allowed to crystallize in vats of sun-dried clay. The crystals are about ½-inch diameter, and of a light grayish-green color.

These are stacked and allowed to drain for 10 days. After this they are put into earthen pots holding about 1½ maunds (112) pounds) with a little water, and are heated in a kiln or oven The earthen pots are broken open when cool, and large crystals of alum, some six inches long, are found inside. This is the form in which it is sold in the bazars. These works produce some 3000 maunds per annum. From three to four seers of alum (seven to nine pounds) is about the quantity obtained from each maund (75) pounds) of black shale.

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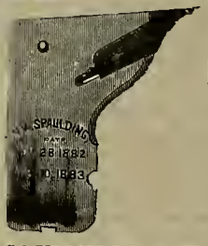

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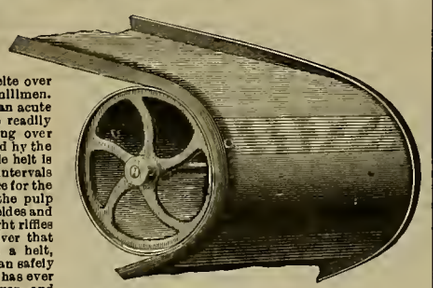

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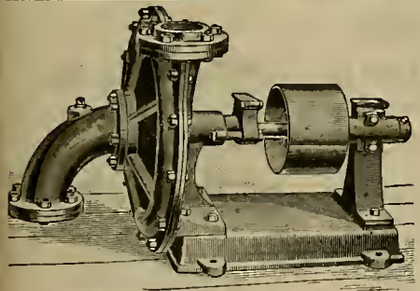

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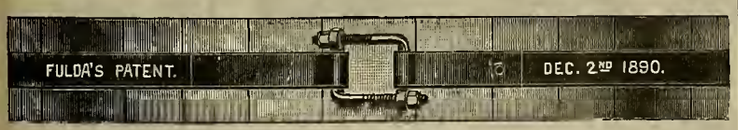

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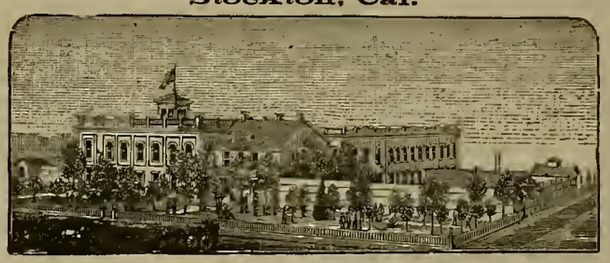

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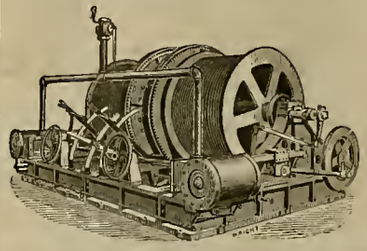

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Useful Information.

Facts Concerning Dynamite.

Very few people have a correct idea of what dynamite is, of what it is made, and the uses to which it is put. To the French belongs the honor of its discovery and its practical use. Nitroglycerin is the force of all high explosives. Dynamite is the name most usually given to these explosives, though other names are sometimes used.

Dynamite is simply nitroglycerin mixed with various ingredients. Nitroglycerin is made by mixing sulphuric and nitric acid with sweet glycerin, the same that is used by the ladies to prevent chapped hands. Mixing the acids and glycerine is where the danger lies in the making of nitroglycerin. The mixing tank, or agitator, as it is called by dynamite makers, is a large steel tank, filled inside with many coils of lead pipe, through which, while the mixing is in progress, a constant flow of ice water is maintained. This flow of ice water is used to keep the temperature of the mix below 85 degrees, as above that point it would explode, aod a hole in the ground would mark where the factory had been. The nitroglycerin is stored in large earthenware tanks, which are usually sunk in the ground to guard against blows or severe concussion.

The other ingredients for making dynamite are: nitrate of soda, which is found only in Chili, carbonate of magnesia, and wood pulp. Dynamite is put in paper shells, usually one and quarter inches in diameter and eight inches in length, and weighs about one-half pound to each shell or cartridge. It has largely taken the place of black powder for blasting, as it is many hundreds of times stronger, and consequently more economical. It is used in mining all kinds of ores, coal and rock, submarine blasting and railroad-building. Without its aid many railroads, especially those crossing the Rocky mountains, could not have been constructed, and Hell Gate in New York Harbor could not have been destroyed.

Dynamite will not explode from any ordinary fall or jar; it will burn without explosion and freezes at 42 degrees, 10 degrees above ordinary freezing point. The bomb of the anarchist is made of metal or glass and filled with pure nitroglycerin, arranged so as to explode by severe contact with any hard object. These bombs are, of course, never made by a reputable dynamite factory. Five or six millions of dollars are invested in the manufacture of dynamite in the United States, and its use is constantly on the increase. The fumes of nitroglycerin produce intense headache, which can be cured by taking a very small dose of it internally.—Exchange.

BOXWOOD. — Boxwood, imported into Eogland from Turkey and Asia Minor, and used by engravers and for the manufacture of rules, mathematical instruments, shuttles, etc., has risen in price so rapidly, owing to the exhaustion of the eastern forests, that dealers are searching in every direction for a substitute. For engravers' use no substitute has as yet been found, but for the manufacture of shuttles, which consumes vast quantities of timber in the weaving districts of England, American dogwood and persimmon are beginning to find considerable favor, and the trade in these woods, if fostered, bids fair to assume considerable proportions. The American consul at Manchester, Mr. Grinnell, writes as follows concerning it: "The best wood from the United States to supersede boxwood is dogwood (cornel, as it is more commonly called here), which, owing to its relatively moderate price ($18 to $20 per ton), may, it is thought, if more carefully selected, ultimately replace the more expensive boxwood for the purpose in question. The pieces should not be less than five or six inches in diameter, in length as long as convenient, say 12 feet, to be cut here into 13 or 14-inch lengths for working up. Of course, the wood should not be split, and the greater the diameter the better, if the heart is sound and it is free from other fault. It is again urged upon the shipper, as vital to the interests of himself and the trade, to reject all pieces doubtful or bad."

SILVERING GLASS.—The following method of silvering glass is said to be eminently successful, and is largely adopted in many manufactories: "There are two solutions used in the process, known respectively as the reducing and silvering solutioos. To prepare the first, dissolve 12 grains of Rochelle salts in 12 ounces of water, and boil; then add, while boiling, 16 grains of nitrate of silver dissolved in an ounce of water, and continue the boiling for 10 minutes more, after which add water sufficient to make 12 ounces. To prepare the second, dissolve 1 ounce of nitrate of silver in 10 ounces of water; then add liquor ammonia until the brown precipitate is nearly, but not quite, all dissolved; then add one ounce of alcohol and sufficient water to make 12 ounces. Distilled water should be used in making these solutions. When both preparations are ready take equal parts of both solutions and mix them thoroughly; then lay the glass face down on the top of the mixture while still wet, the glass being carefully cleaned with soda and well rinsed with clean water. About two drachms of each solution will be sufficient to silver a plate two inches square. The dish in which the silvering is done should only be a little larger than the plate. It is better to let the solution stand and settle two or three days before being used."

FIRE-PROOFING MATERIAL.—The recent fire test of a fireproof building at Chicago is a most valuable lesson to engineers and contractors engaged on this class of work, as well as to the manufacturers of the fireproofing material used for covering the metal columns and beams of the skeleton framing of these steel buildings. The fire was a hot one, but very little injury was done to the steel structural work of the building, except where the fire-proofing had not yet been put on, or where it had been put on in so faulty a manner that its fastenings burned away, allowing the fireproof covering to fall off. The owners of the building were wise in having the structure examined by experienced engineers, and the engineers' report shows clearly the effect of the fire. The report also shows the very high degree of safety of such a building when properly constructed. When fireproof material is used to protect any part of a building, it is of the utmost importance that it should be so secured that it canoot be burned off, or easily knocked off by any light falling material. One view of the case is that the fire-proofing in this case was ruined by water being unnecessarily poured oo it when thoroughly heated and when the fire had already done all the damage possible. This is scarcely a fair view, however, as if properly put on, this fire-proofing would have been secure; and in any case the first duty of the firemen is to put out a fire and prevent it from spreading, and they cannot and should not be expected to stop and find out whether the fire has completed its work before they begin to try and extinguish it. There might have been persons in the building, and it was far better to risk damage to the structure than to risk human life. In future work of this kind, the absolute necessity of so securing the fire-proofing material that it will stay in place, and fulfill its purpose when subjected to test, sbould be recognized and insisted upon very strongly.

SPONTANEOUS COMBUSTION. — Among the results brought to light through chemical investigatioos of the sources of spontaneous combustion, says the *United States Miller*, is the fact that sawdust should never be used to collect drippings or leakages. Dry vegetable or animal oil is found to inevitably take fire when saturating cotton waste at 180 degrees Fahrenheit, and spontaneous combustion occurs more quickly when the cotton is soaked witb its own weight of oil. Danger is involved in patent "driers," from leakage into sawdust, etc.; oily waste of any kind, or waste cloths of silk or cotton, saturated with oil, varnish or turpentine, also linseed-oil drippings into a sponge; glycerio or oil of any kind leaking into sawdust; bituminous coal in large heaps of pit coal, hastened by wet, and especially when pyrites are present in the coal—the larger, the greater the liability. Oil on flour, or water on flour, is productive of spontaneous combustion. In fact, all organic structures, being largely composed of carbon and hydrogen, are readily excited, because of the affioity of the hydrogen for oxygen.

DEMAND FOR SEAMLESS TUBES.—In regard to the rapid growth in the use of seamless steel tubes, Birmingham is the chief center for the manufacture of seamless steel tubes in variety, the increase in the industry being characterized as remarkable. Bicycle makers and engineers are the principal consumers in this line; indeed, whatever metal tubing is required that has to withstand an exceptionally great strain, and where the employment of steel is practicable for the purpose, the seamless tube is increasing in request. It is claimed to have added materially to the efficiency and durableness of hydraulic machinery. A ¾ inch tube with a core of ½ inch can be drawn in steel to withstand a pressure of 1000 pounds on the square inch, and it has now for some time been largely and satisfactorily used for boilers instead of copper-tubing; the cost is found to be considerably less, while its durability is as great, and in the case of high-class steel, its reliability will compare quite favorably with the ordinary copper tube.—Machinery

By-Products in the Hennin Gas Process.

The Springfield (Ill.) Iron Company reports, says the *American Manufacturer*, that the Hennin gas process, which has now been in practical operation in its works for more than a year, furnishing all the fuel gas in its No. 1 bar mill containing its 12 and 16-inch merchant trains, is still not only working to its complete satisfaction, but improves almost daily. The plant consists of five wrought iron shell circular gas producers, somewhat resembling the Wellman producers, in which the gas, tar and ammonia is generated. These products of distillation are removed from the producers by a rotary exhauster and passed through a series of washers, condensers and scrubbers, which remove the ammonia and tar from the gas. The gas as sent from the works is therefore entirely fixed and non-condensible, and is almost absolutely free from sulphur and other impurities. It is found that a very large saving results from extracting the ammonia and tar from the gas, and the gas made is of very high efficiency and of great value as fuel, averaging about 60 per cent combustible matter against 25 to 30 per cent combustible in ordinary producer gas. The ammonia is secured in water as ammoniacal liquor, the same as in ordinary illuminating gas works. The Springfield Iron Company has erected a very complete plant for the distillation of the liquor, which is the process by which the ammonia is finally secured. The distilling plant consists of a very large Gruneberg-Blum continuous still, and two saturators which have a capacity of 2500 to 3000 pounds of sulphate of ammonia in 24 hours. At present all the output of ammonia is made into sulphate, but the plant is prepared with some very slight changes in the apparatus to make either other salts of ammonia or condense the ammonia into concentrated liquor of any strength. The company has recently added to this department a very complete plant for the distillation of the coal tar made and its manufacture into pitch.

CARRYING CAPACITY OF WIRES.—The safe carrying capacity of a wire is that current which it will convey without becoming painfully warm when grasped in the closed hand. In reference to this it must be remembered that this test cannot safely be made with the wires carrying currents for arc lights, and it is intended to be applied only with reference to the conductors of incandescent lights. These may be handled without risk; but the conductors of the arc lights, where, as is usually the case, there are a number in series, a severe shock may be experienced on touching the wire, and if a ground connection existed by chance elsewhere, and some other conditions were present by which the full force of the current passed through the body, this shock might be fatal.—Electrical Age.

NOTICE OF ASSESSMENT.

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Notice is hereby given that at a meeting of the Board of Trustees, held on the 22d day of November 1892, an assessment (No. 70) of Twenty-five cents (25c) per share, was levied upon the capital stock of the corporatio , payable immediately in United States gold coin, to the Secretary, at the office of the company, room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the TWENTY-EIGHTH DAY OF DECEMBER, 1892, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 20th day of January, 1893, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Trustees.

ALFRED K. DURBROW, Secretary.

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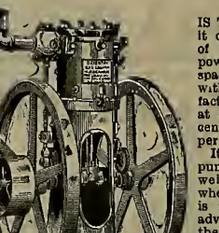

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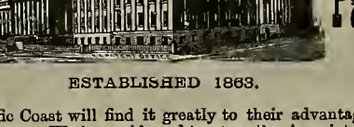
Scientific Press  Patent Agency.

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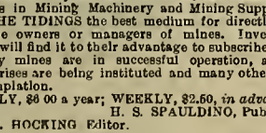

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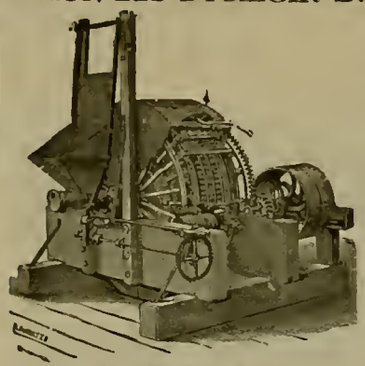

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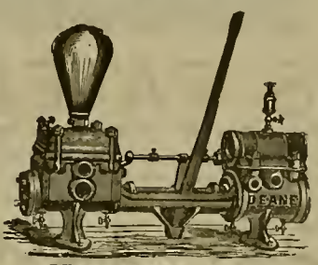

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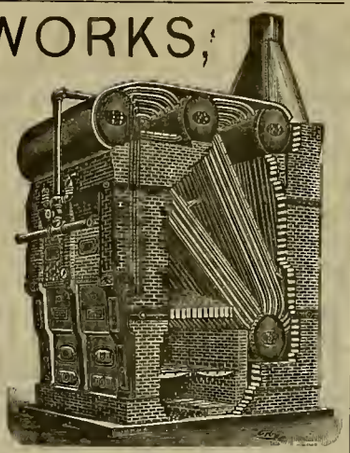

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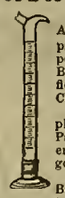

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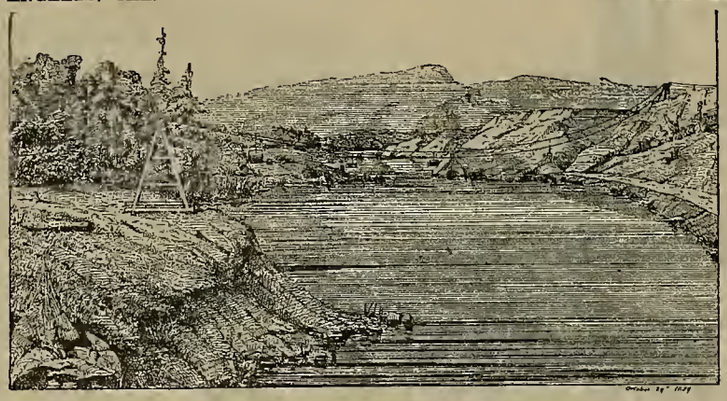

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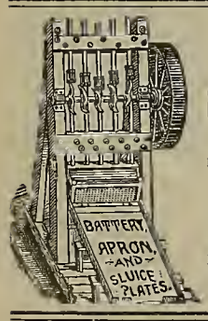

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

PIONEER.—Amador *Ledger*, Dec. 16: Messrs. Fisher and Shay, who have charge of the Pioneer mine, in the district of that name, have struck a good-sized lead of paying ore.

THE LONE STAR.—Flattering reports are being received from the Lone Star, or Hnrley gold mine, on the Mokelumne river, near West Point. The owners have been going down in the granite, and, contrary to the generally accepted theory, have struck a vein of quartz which pays from $18 to $40 per ton in free-milling gold.

PINNEVITTA.—The Pinnevitta, also in the Pioneer district, belongs to Scott & Stirnaman, and is worked from a tunnel. The ore from this is very rebellious, and has to be shipped to Selby's Works to be smelted. This process is very expensive, it is true; but as the ore goes close to $800 per ton, it pays pretty well for all that.

THE THEUCROFT.—In the Theucroft mine, formerly the property of the Reichlings, but now being worked by Mr. Marchaund, a 16-foot ledge was encountered recently, which looks as though it would turn out very rich. The ledge was struck in a crosscut to the west from the main tunnel. Mr. Marchaund crosscut to the west contrary to the advice of many of those who had mined in Pioneer district, where the claim is located, but the result shows that his judgment was correct.

AMADOR VIEW.—James & Stirnaman, the owners of the Amador View, where they made the rich strike some time ago, succeeded in demonstrating the fact that the Mexican miners did not secure all the gold in the mines they worked. Their mine is a continuation of one of the old Mexican shafts, and is not down more than 40 feet from the surface. They have been using a windlass to do their hoisting, but will soon put in a whim. They have a five-stamp mill working on $70 ore in free-milling gold.

SUTTAA CREEK.—Cor. Amador *Ledger*, Dec. 16: Sinking in the Wildman mine, which has been in contemplation for some time, will be commenced in a few days. Mechanics from Knight & Co.'s foundry have been engaged for a few days in placing a gate in position in the pipe, so that in case the main pipe should burst again the water can be turned from the mill to the hoist, thus averting the necessity of all hands who might be in the mine climbing by ladder to the surface. One hundred feet, and possibly two hundred, will be sunk. It is uncertain yet just when sinking will be commenced in the South Eureka—most likely, however, not until spring, owing to the amount of water they have to contend with at present. Drifting is still being pushed on the ledge in the south drift, which improves as developments go on. Considerable ore of a paying quality is being taken out at the Hector from the surface drifts, and preparations are being made to drop the stamps again in a few days. At the Belmont there is not a great deal being done just at this time, on account of the inadequacy of the machinery to cope with the water they have to contend with.

PLYMOUTH.—Cor. Amador *Ledger*, Dec. 16: Bay State stock has taken a sudden rise—a fact which has astonished the most sanguine shareholders. Judge Richardson, I am told on reliable authority, bought, last week, an indefinite number of shares at 45 cents—an advance of 20 cents over former transfers. Shareholders are taking advantage of this sale and asking an increased price for their stock. I heard to-day that a few shares could he purchased for $1, but inquiry failed to locate the stock. I cannot attribute this sudden rise to any other cause than that all the shareowners in this mine know exactly what is in sight, and that in a few days the new machinery will be ready to start up, and that when 40 stamps begin to run on $8-rock the results are bound to greatly increase the value of the stock. The new machinery is daily arriving and being placed in position as rapidly as the best experts can do it, and we expect to see all the water out of the mine very shortly and a large force of men at work. The Wilds & Wheeler Company is bending all its energies to the completion of its new mill, and if the weather permits, A. M. Vaughn, the celebrated millwright, will soon have a first-class five-stamp mill from Knight & Co.'s foundry at Sutter Creek pounding away on $80 ore. This I consider one of the richest discoveries made in Amador county for years. The vein found on the surface was but about 18 inches; at a depth of 50 feet it is 6 feet wide and at the bottom of the shaft it is now fully 12 feet. From the rock milled from the shaft, and from assays carefully made of the rock all the way from the top, it is estimated that the ore will yield at least $80 per ton.

THE BAUDEN.—Dr. Boysou's shaft on the Bauden purchase, under the able management of W. F. Jones Jr., is going down finely. They have reached a depth of 50 feet, but as the shaft was started in the footwall, it will not cut the ledge short of 100 feet. It is generally thought by old-time miners here that this is going to prove a valuable property, the surface rock having yielded largely in free gold. Dr. Boyson is expecting daily to begin operations on an extensive scale on the Shearer plant, situated just south of the Bay State. I understand from Mr. Jones, the superintendent of the Osceola, that work on this new development is progressing satisfactorily, and that the San Francisco owners are highly pleased with the outlook. All the idle men around the town have been engaged for the past two weeks in doing assessment work on the various locations in this vicinity and in repairing the damage done by the late storm on the system of ditches that supplies this place with water.

Butte.

THE TOLLES MINE.—Oroville *Mercury*, Dec. 16: The Tolles quartz mine, situated near Hnrleton, which was the property of J. S. Tolles, has been sold. The purchasers are L. C. Jacobs, J. D. Mowser, D. S. O'Callaghan and E. W. McCauley. It is the intention of these gentlemen to at once commence development work upon the property and a team loaded with supplies and tools left for the mine this morning. Mr. McCauley will be superintendent. The ore assays well and carries a high percentage of sulphurets.

THE PHŒNIX MINE.—Oroville *Mercury*, Dec. 14: Dr. T. W. Serviss, Dr. F. W. Gibson and George C. Colman have formed a copartnership and yesterday completed the purchase of the Phœnix quartz mine, near Hurleton. Considerable development work has already been done, and it is a ledge noted for its free gold, while the assays of its sulphurets, of which it carries a heavy percentage, run very high. It is the intention of the company to at once put in a mill and concentrators for the purpose of working the ore. Messrs. Gibson and Colman went to San Francisco this morning to complete the purchase of machinery. Work will at once be commenced on the mill and mine.

Nevada.

FORTUNA MINA.—Grass Valley *Telegraph*, Dec. 16: We learn that the Fortuna mine, which is located near Nevada City, is about to resume operations. The mine was at one time operated by the Hon. H. F. Page.

THE RAOULAR THINO.— Nevada *Transcript*, Dec. 16: At a meeting of the directors of the Champion Mining Co., held on Tuesday last, a dividend of 10 cents a share was declared. This makes the 26th, and there are innnmerable more in sight. The Champion quartz mine is second only to the Idaho.

OPENING IT SYSTEMATICALLY.—Messrs. McKenzie and Wheeler are running a 300-foot bedrock tunnel in the Knickerbocker drift claim just west of town. They are doing the work by contract. It is a valuable property, as evidenced by the development made during the last two years, and the new tunnel will put it on a first-class producing basis.

LOOKING FOR INVESTMANT.—Some four or five gentlemen from below are in this district at the present time looking for mining properties. They have been looking at several of the old unworked mines, and it is rumored that a sale or two of these properties will soon take place.

THA FORTUNA MINE.—Nevada *Transcript*, Dec. 17: It has been rumored here about a dozen times in as many years that work would be resumed on the old Fortuna mine, and we understand that work is now being done there with the intention of reopening the mine. It is generally believed that the mine is a good one. Robinson and others sold it to San Francisco and Eastern parties, and they incorporated under the laws of the State of New York. They sold the stock and it was scattered from Maine to Georgia. Part of the money arising from the sale was expended in doing some work on the property, but not enough to show up the true value of the mine. It was subsequently sold at sheriff's sale and bid in by the late H. F. Page. Since the death of Mr. Page, the property was sold again and bought in by parties residing at Vallejo, and is now owned by them. We learn that arrangements have been made to resume work, but whether by the owners or by parties who have a bond on the property, we are not informed. One thing is certain, that if the mine is ever properly opened up it will prove one of the best properties in this district, as there is a complete network of quartz ledges running through the section where the Fortuna lies. The heaviest gold-bearing rock ever taken out here came from near the surface of the Fortuna.

RUMORAN SALES.—*Transcript*, Dec. 18: It is reported upon what seems to be good authority, that negotiations are now going on for the sale of three quartz and two gravel mines in this vicinity. No work of any consequence has been done on any of the mines referred to, with possibly one exception, for a great many years. If started up, and it is confidently believed they will be very soon, it will make a big difference in the business of this city, as a very large number of additional men will be employed, and the amount of money in circulation thereby greatly increased. A gentleman who is well posted upon what is going on, told the *Transcript* reporter to-day that he was confident that from four to six hundred men, in addition to those already employed here, would be given work within six months from this time. He informs us that the Fountain Head and Cold Spring gravel mines will be consolidated and worked by San Francisco capitalists, the old Fortuna, Sneath & Clay, the Sharp and two or three other mines upon which little or no work has been done during the past 15 or 20 years, will be in full blast. This certainly is very encouraging news to our people, and all will anxiously await its realization.

NORTH BLOOMFIELD.—Sacramento *Bee*, Dec. 16: Robert T. Devlin and A. H. Wilhur, counsel and manager of the State Anti-Debris Association, respectively, returned Sunday night from a visit to the North Bloomfield mine, situated about 14 miles north of Nevada City. They were accompanied to the mine by two civil engineers, and the object of their visit was to make preliminary arrangements for a survey of the mine and the alleged settling reservoirs which have been erected for the purpose of determining the capacity of the reservoirs and the amount of material in the banks capable of removal. This was done to enable the Anti Debris Association to protect itself against any abuse of the modifying order of Judge Gilbert of the United States Circuit Court, allowing hydraulic mining to be resumed in this mine by the erection of restraining works. The North Bloomfield mine is one of the largest not only in California, but in the world. Its system of reservoirs, ditches and pipes represent an outlay of over $3,000,000. This mine has been enjoined by the Circuit Court of the United States, in suits brought by the United States Government to preserve the navigability of the river, and by Edward Woodruff, a property-owner in Marysville, to preserve his lands from injury. Injunctions were issued, and for over two years the mine had lain idle. The company then began the erection of brush dams, and made application to the United States Circuit Court in San Francisco for a modification of the injunction, on the theory that for at least two years they could mine and store the greater part of their debris behind their brush dams. Judge Gilbert of Oregon, who succeeded Judge Sawyer in the trial of the case, made a visit to the mine last summer, in company with the representatives of the two interests, examined the restraining works and modified the injunction by permitting the mine to continue operations. The antidebris people have no faith in these brush dams, and believe that a resumption of mining under this system will be as injurious to valley interests in the future as it has been in the past. But so far as the Federal Courts are concerned, Judge Gilbert believes in their efficiency, and it was for the purpose of gathering accurate information by surveys and cross-sectioning that a visit was made Friday and Saturday of last week by the officers of the Association and civil engineers. Mining has not yet commenced at the North Bloomfield, but they expect to resume mining under Judge Gilbert's decree in the spring.

Shasta.

IGO ITEMS.—*Courier*, Dec. 17: The South Fork Mining Co. is doing some work, but just when they will start up I cannot say. E. L. Ballou is pushing his reduction works to completion, and all hope they will prove a success. Robinson and Son are doing some work on their mines, and W. D. Bull is taking out some very fine ore. The Bully Choop mine has shut down for the winter on account of snow.

Siskiyou.

RIVER CLAIMS.—Yreka *Journal*, Dec. 17: All the claims along the Klamath river, except the Phil Mott and McConnell & Quinne, are still being worked with very good success. In the Centennial a rich pay streak has been found at bedrock of last cut, from which a good supply of dust is realized. The Chinese claim, below Honolulu, pays exceedingly well at one derrick, but the other does not pay very much, hence the Chinese company is not doing quite as well this year as during last season, but the prospects ahead are excellent for big strikes. The Boyle & Co. and Spencer quartz mines on Humbug creek, have been closed down on account of snow, which is about three feet deep on the mountain at present. A couple of men will be kept at each mine to clear the snow from the buildings during snowfalls. Another very rich ledge was discovered accidentally last week by Hunt & Co., while digging a tunnel to drain the shaft at the old ledge, which promises to prove a bonanza in value and extent. This location is owned by a San Francisco company and is under the management of Mr. Hunt, who put up a mill last summer. Louis Scheld has a force of men at work drifting in his placer claim at Greenhorn gulch on Yreka Flats, so as to have a good supply of pay gravel on hand when water is plenty, which seems certain from the large amount of snow on the Humbug range, to be melted when warm rains occur or after the present cold spell is over. Cartwright & Co. have sunk down about 640 feet on their quartz ledge, the Mountain Belle, at North Fork of Humbug, and find high-grade quartz paying from $40 to $60 and over per ton, with the ledge varying from six inches to four feet in width. They are on the sunny side of the mountain, where the snow melts rapidly under the heat of the sun, which permits working at all times, there being less than 18 inches on the ground around their claim at present.

Tuolumne.

STRIKE.—Tuolumne *Independent*, Dec. 17: A rich strike has been made in the Gloster Cook and Ryan mine, on Spring Gulch. A. W. Moulton, who has the mine bonded, while prospecting up above where he has been working the vein—some 400 feet above the tunnel—struck a prospect, and in opening it up, uncovered some of the richest rock ever found in the mine. It will average in free gold $100 per ton and the sulphurets will go over $400.

NEVADA.

Washoe District.

CON. CALIFORNIA AND VIRGINIA. — Virginia *Chronicle*, Dec. 17: All ore extraction has been suspended for the last five days of this week. At a late hour on Saturday night, Dec. 10th, fire broke out near the south end of the mine under the 1650 level old stopes. From near the point where the fire was seen there is an upraise connection with our 1500 level stopes. The gas and smoke escaped up through this opening and caused our men on that level to make a hasty retreat north through our drift openings to the Ophir shaft. The Con. California & Virginia old shaft is upcast, or outlet for air. The C. & C. shaft is downcast, or inlet for air. Therefore, to control our fire troubles as speedily as possible, it was necessary to bulkhead our 1650 level, southwest drift and the openings leading to the 1750 and 1800 levels. Temporarily we are entirely shut out by brick and cement bulkheads from the two last-named levels. Our 1650 level northwest drift leading to our 1600 level, thence to our 1500, is in good order; the air for ventilation is good and free from gas. We have a limited number of men working through all these last-named openings, and expect to resume the extraction of ore from them in a very short time. The gas escaping through the Con. Cal. & Va. shaft is gradually decreasing. Have extracted from the mine during the week 227 tons of ore, which was shipped to the Morgan mill, together with 646 810-2000 tons of ore taken from the ore-bins, the average assay value of which, per car samples, was $23.47 per ton. The average assay value of all the ore worked at that mill during the week, 936 tons, was $21.43 per ton per battery assay. Bullion on hand in our assay office, which will be shipped to the Carson Mint to-morrow night, assay value, $18,-134.73.

OPHIR.—1465 level—The upraise started on the sill floor, on the north side of the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 feet below the sill floor of this level, has been carried up 8 feet; total height, 38 feet, continuing in porphyry showing lines of quartz.

MEXICAN.—On the 1465 level the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 22 feet; total length, 395 feet; continuing in a porphyry formation with lines of quartz.

UNION CON.—900 level: The joint Union Con. and Sierra Nevada west drift, has been extended during the week 20 feet; total length west from the joint shaft, 2728 feet. Have passed through a fissure two and one-half feet wide, which was filled with clay and quartz, from which there is a strong flow of water. The face is now in porphyry.

UTAH.—340 level—West crosscut No. 3, from the north drift from west crosscut No. 2, at a point 195 feet in from its mouth, has been extended 17 feet; total length 23 feet. The face of this crosscut is in a porphyry, clay and quartzite formation, showing some water.

SIERRA NEVADA.—West crosscut No. 2, from Kenosha tunnel, started from north drift, 800 feet in, has been advanced 27 feet; total length, 454 feet; face in hard porphyry. The joint Sierra Nevada and Union west drift, 900 level, was advanced 20 feet; total distance west of shaft, 2728 feet. Have passed through a fissure, 2½ feet wide, which was filled with clay and quartz, from which there is a strong flow of water. The face is now in porphyry.

BULLION—West crosscut, 160 feet north of top of upraise, 320 feet south of north line, 1800 level, is out 26 feet; face in soft porphyry. West crosscut, 390 feet south of north line from Ward shaft, 1800 level, is out 90 feet; face in clay and porphyry.

CHOLLAR.—Are repairing north drifts on the 450 and 550 levels, and the main shaft between the 850 and 930 levels. The north drift from the east crosscut, 160 feet south of north line, 930 level, was not advanced any on account of retimbering the east crosscut.

ALPHA.—The joint Alpha and Exchequer east crosscut on north line of Alpha is out 130 feet; face in porphyry.

EXCHEQUER.—The joint Alpha and Exchequer east crosscut on north line of Alpha is out 130 feet; face in porphyry.

WAAN SHAFT.—Joint Alpha and Exchequer east crosscut, on the north line of Alpha, is out 130 feet; face in porphyry. The west crosscut, 300 feet south of north line of Bullion from Ward shaft, 1800 level, is out 90 feet; face in clay and porphyry. During the week, have been grading the connection from the northwest drift on the Ward shaft, 1800 level, with Potosi winze.

POTOSI.—The raise from No. 1 crosscut, 1100 level, is up 90 feet; the south end showing from two to two and one-half feet of ore of good grade. Part of the roof is now in clay and porphyry, which is cutting out the ore. The east drift from Potosi winze station, 1000 level, is out 82 feet; face in soft porphyry and streaks of quartz. During the week have been grading the connection from the northwest drift on the Ward shaft, 1800 level, with Potosi winze. Extracted and sent to the mill the past week 354 tons and 750 pounds of ore from the 550, 930 and 1150 levels; milled during the week, 353 tons; on hand at mill, 70 tons 1900 pounds. Average battery assays, $24.85. Average car sample assays, $29.10. Shipped to Carson Mint, 343¾ pounds of crude bullion.

SILVER HILL.—The north drift on the 160 level has been advanced 9 feet through quartz, the car samples of which average to about $17 in gold. Completed upraise in the south drift from the Justice shaft, 622 level, to the Silver Hill north line, and started a drift from there in a southwesterly direction; formation, hard porphyry.

GOULD & CURRY.—200 level: West crosscut No. 5, started 432 feet from main west drift, has been advanced 17 feet through hard porphyry; total length 177 feet, West crosscut No. 6 from main north drift has been extended seven feet; total length 36 feet; face in porphyry, clay and quartz. On the Sutro tunnel level, the joint north drift with Savage Co. has been advanced 20 feet through hard porphyry; total length, 744 feet.

BEST & BELCHER.—200 level—During the past week the northwest drift has been advanced 19 feet; total length, 86 feet; face in porphyry and stringers of quartz. 900 level—Have resumed work in west crosscut No. 2 and advanced same 18 feet through porphyry: total length, 94 feet.

OCCIDENTAL.—The upraise from south drift, 750 level, is up 36 feet; top in low-grade ore. The north drift, 750 level, has been extended 18 feet; face in low-grade ore. Crosscut No. 2 in Zadig drift, Sutro tunnel level, is in 71 feet, and has entered the vein; the material in the face is porphyry with streaks of quartz.

ANDES.—On 420 level north drift from east crosscut No. 1, north, advanced 6 feet; total, 19 feet. This drift is all in quartz.

HALE & NORCROSS.—We continue retimbering main shaft at the 700 level. Main incline—Are

making the necessary repeirs, and ere retimbering a portion of incline between the 1700 and 1800 levels. 1800 level—Advanced No. 1 west crosscut 25 feet; totel lengtb, 239 feet; fece in porphyry with streeks of quertz. West crosscut No. 3 was advanced 22 feet; total length, 175 feet; fece in porphyry and streaks of quartz. Advanced No. 4 west crosscnt 18 feet; total length 28 feet; face in quartz and porphyry.

East Best & Belcher and Noath Gould & Curay.—Started work last Monday, both mines being worked from the Eest Best & Belcher shaft, new hoisting works and new patent windlass.

Tuscarora District.

Navajo.—*Times-Review*, Dec. 16: The stopes above the 350-foot level are looking abont the same.

Belle Isle.—Have started to extend second stope above the 250-foot level southward, where some good ore is showing. No change to report elsewhere.

North Belle Isle.—The stopes above the 400-foot level are yielding a little very good ore. No material change in the stopes from the 300-foot level.

Elko Con.—North drift from the incline shaft extended 10 feet.

ARIZONA.

The Bucyrus Machine.— Prescott *Courier*, Dec. 17: At Stanton, Mr. Rybon visited the pl..cer camp, where he saw the Brobdignegian Bucyrus steam shovel at work, and describes it a most perfect piece of machinery, which works from a regular car which advances on the track as the great shovel clears the way, lifting 2700 pounds of earth and rock at each shovelful and throwing three a minute, handling as much earth as 30 men would each minute. Nothing seems to obstruct the shovel as it attacks the previonsly untouched hillsides and scoops up immense boulders with no hitch or check in the machinery. That these shovels will work wonders in onr placer gold-fields is now settled beyond question. The work now being done is to clear ont a channel for the erection of the amalgamator, and the dirt now being turned over will he the only dirt that the company expects to handle twice. Mr. Fuller, the superintendent, has now about 15 men at work. It has beeu estimated, from very careful prospecting, that this ground will average 35 cents in gold to the cubic yard.

The Oao Bella Mine.— Prescott *Courier*, Dec. 17: The Oro Bella Company will soon erect et the Oro Bella mine, Tiger mining district, near Prescott, one of the newly introduced Crawford quartz mills for the reduction of sulphnret ore to hullion. These mills have been successfully introduced near Hillsborongh, N. M., where they ere now running on sulphuret ores and saving 97 per cent of the gold. The inventor of this mill, Mr. Crawford, styles it "the Crawford mill for the mechanical reduction of gold ores," the priciple of treatment being placed npon mechanical reduction instead of the complicated process now so much written about and so seldom successful. This mill grinds the ore into extremely fine particles, the pulverized mass dropping into a quicksilver bath beneath. "Will reduce daily 100 tons of metalized stone to a 120 mesh at a cost of $100, which incldnes labor, wear and tear and renewals." This means that the ore is crushed to a sufficient fineness to pass through a silk handkerchief, and if there is any gold in it, it must be released from its rebel coating and be within reacb of the quicksilver. This mill, it is claimed, will run with from "500 to 1500 gallons per ton of ore crushed, whereas the ordinary stampmill reqnires not less thau 2000 to 8000 gallons of water per ton." The introduction of this mill by the Oro Bella Co. will be watched with great interest by mining men of this section, and should it prove what is claimed for it, men without gold in their pockets will be very scarce in this section, and a population will rapidly increese to meet the demand of the mill-owners for ore, and mine-owners for men to take the ore ont. There will he no lack of ore.

Hillside.—Prescott *Courier*, Dec. 16: Reports from the Hillside are that the Seven Stars Mining Co. is making preparations for working those splendid properties on a great scale, and costly and substantial improvements are steadily in progress; 2000 cords of wood are piled up near the mine and a lerge force of woodmen is employed adding to it.

Lackawanna.—Arizona *Journal-Miner*, Dec. 14: Phœnix papers announce that A. B. Ellit, an acconnt of whose dream in regard to a mine was published recently in this paper, has gone to the Bradshaw mountains to work the claim of wbich he dreamed. A quantity of ore taken from the claim assayed $642 in gold and $38 in eilver. Relying on his dream, Mr. Ellit is confident that his present visit to the mine will develop ore of a richness nnheard of among the mining men of the the territory. Geo. H. Curry ceme in yesterday from Tonto Besin to secure some additional parts for the machinery which he is erecting on the Lackawauna mine. He seys he expects to have the mill running within 15 days, the recent storm having furnished them with an ahundance of water. The mine is looking splendid, and great hopes are entertained for a successful and profitable run of the mill, every indication at present pointing to that end.

Mammoth.— Florence *Tribune*, Dec. 14: Work on the Mammoth mine, Cesa Grande district, is being pushed forward vigorously. The mine is owned hy Johnson & Hadley, who are extensive mine-owners in Colorado. Mining is their bnsiness, and, being practical men, they usually meke a success of the mines they take hold of. Mr. Carey is superintendent of the mine. The proprietors have made all arrangements for the erection of a 20-stamp mill as soon as water is ohtained, sinking for which will commence soon. Another producing mine will thus soon be pleced to the credit of Pime county.

Bonded.—Tombstone *Epitaph*, Dec. 19: The Casey mines at Dos Cabezes were bonded yesterdey to a New Mexico syndicate for $95,000. B. S. Coffman of this city, and a mining men named Moore, negotiated the deal. Tbe terms of the bond are not known, but it can be positively stated that the mines will be worked from the start.

BRITISH COLUMBIA.

Will Ship a Caaloan of Oae.— Nelson *Miner*, Dec. 14: The owners of the Mile Point claim. in Ainsworth district, will ship a carload of ore to Great Falls next week. Tbe tunnel is in about 50 feet, 25 feet of the distance in ore, the vein now being fully five feet wide. The ore tbat will be shipped samples 150 onnces to the ton. No mine in the whole lake conntry is so favorably situated for shipping ore, a Siwash and a wheelbarrow easily landing a carload in a few hours at a point where it can be loaded on steamboats.

Smelters Now Pay the Duty.—Formerly the dnty on ores shipped from tbis section to smelters in the United States was paid by the mineowner, the valne being ascertained by the collector of customs at Bonner's Ferry or at Little Dalles. This often caused vexatious delays. Now the smelters give bonds tbat they will make correct returns of the value of all dutiable ores smelted by them, and they pay the duty, charging tbe amount to the shipper of the ore.

IDAHO.

Finds on a Reseavation.— Nelson *Miner*, Dec. 17: Wbite men, who have been secretly prospecting in tbe Lemhi Valley Indian Reservation, in Lemhi connty, Idaho, have discovered some wonderfully fine gold and copper ledges which they are trying to hold until tbe reservation is thrown open for settlement. The redskins, however, are fully cognizant of tbe value of tbe great deposits of mineral, end tbreaten to burn the white men at tbe stake if they do not leave tbe Indian lands. The gold ledges, which both the reds and the whites are so determined to possess, are well defined, the formation being decomposed quartz, the ore being free milling and unusually rich. The copper ledges are said to be very large and valuable, it being claimed that they are in the great mineral belt in which Marcus Daly's famous Anacouda mine is located. The reservation will probahly next year he thrown open to settlement after the Indians have been allotted their share of the land, bnt it is feared that there will be considerable trouhle experienced before the ownership of the stores of mineral wealth is finally settled. It has long been known that the gulches of the Lemhi Indian lands were full of gold, the redskins having frequently displayed very large nuggets and many specimens of gold qnartz, that, in richness, equaled the picked ore taken from the Nelson ledge in Angel's Camp, Calaveras conuty, California.

Indian Creek and Neal.—Elmore *Bulletin*, Dec. 16: Judge John Andrawatha came in Wednesday from near Mayfield. He says the Indian creek section is on the eve of a gennine boom, and that even now all is bnstle and activity at the reservoir camp and in Neal mining district. Tuesday, Mr. Clark, manager of the Indian Creek Dam Company, had at least 100 men and 40 teams employed excavating for a dam across Indian creek, which is to be completed by the first of Februery. They have fonnd bedrock at a depth of abont 15 feet, upon whicb will be laid a cemented stone foundation, which will secure a good supply of water heretofore running to waste heneath the lava rock in the bed of the channel, and which they are now compelled to use pumps to keep down. Judge Andrawatha says that Plowman's quartz mill is running steadily and turning ont bricks of gold at regular intervals. The ore not only gives good returns in free gold, hut produces concentrates that assay $200 per ton. Mr. Plowman is highly pleased at his venture in Neal district. Other mines outside those of Mr. Plowman are producing good ore, and another mill, for custom work, will be erected there early next spring.

LOWER CALIFORNIA.

Alamo.—*Lower Californian*, Dec. 14: A friend writes from Alamo: "Tell your friends that Alamo is not dead yet. The Moctezuma mine took out lately 20 tons of ore which represents a value of $20,000. Also on the Tarantula they found ore which ran up to $75 a ton. Joe Peterson is getting things ready at the Aurora to commence work again. The placer workers are getting out a good deal of gold, one husiness honse alone buying in one dey more than $200. The weather is fine and there is plenty of water for washing gold. A good deal of prospecting is heing done also."

MONTANA.

Closing Down.—Butte *Miner*, Dec. 16: The Anaconda properties are closing dowu two at a time, the last to suspend being the Green Mountain and Weke-Up-Jim belonging to the syndicate. These mines ceased their production with the expiration of the work of the day shift on Saturday evening, and will not he started up again until the "hlue dust" at the smelters is worked up, which will require from a month to three months' time. Of the Anaconda mines only two are now producing, and it is said within the next three days they, too, will be shnt down to await the consumption of "blue dust." The two are the Anaconda and St. Lewrence, which adjoin each other. The four mines now closed are the Mountain Consolidated, Higb Ore, Wake-Up-Jim and Green Mountein, the shafts of all of which are being deepened. The numher of meu tbus far thrown out of work hy the Superior aggregates at least 500, many of whom have already left the city and the smoke. Those remaining have a few thousend dollars in their possession, and wonld jnst as soon take a rest as keep on working. At Aneconda only one smelter is in operetion, the other having closed dowu several weeks ago.

Boston and Montana.—With the closing down of the upper smelter, this company hes commenced to phalanx its miners, the first draft being made on Saturday evening, when 16 were laid off at tbe Mountain View. The reason for this is apparent. By the closing down of the works the demand for ore is not so great by 250 tons per day, and there is therefore no room in tbe mines for the large number of men the company has been employing. As to the rumor that all the men working in the lower levels of tbe Butte end Boston properties were to be laid off, those in position to know characterize it as absurd, and wonder where it originated. Tbe Butte & Boston is moving along in the even tenor of its way, and will continue to extract ore enough to keep the smelter turning out its full measure of copper and silver.

The Toledo of Manison.—P. J. McLeary, manager of the Toledo mine in Madison county, was in the city last week and spoke very well of the property. The orebody is from five to six feet in width and carries from 15 to 20 per cent lead, $15 to $20 in gold, and from 30 to 250 onnces silver per ton. Mr. McLeary has a lease and bond on the property and is working 10 or 12 men. Operations are being pushed in the crosscut from the 300-foot station, which is being driven to strike the large ledge. The Toledo is owned principally by Butte men, and has always been considered good.

NEW MEXICO.

Bullion.— Silver City *Enterprise*, Dec. 16: The Maud S. is now working 33 men. A winze will soon be started in tbe lower level. Tbe miners are kept busy supplying the mill with ore. The Maud S. shipped another brick yesterday, wbich makes the 25tb since October 22, 1892. The average weight of each brick has been 82 pounds. As the planchas are one-third gold, tbe value of bullion shipped from the Maud S.—now the Colonial Mining Company—can easily be estimated. The Chance has shipped three bars of bullion since November 18th, weighing respectively 85, 84 and 85½ pounds. Considering that the mill has run only about three weeks the showing is not so poor. The Chance is working smoothly. Twelve feet of ore has been encountered in the winze, which is said to he worth $40. The Kingston smelter is running a good part of the time. One dey last week it treated 32 tons of ore in six hours, which is pretty good, considering that its capacity is rated at 32 tons in 24 hours. The Pacific Company has purchased the vanners in the Deep Down mill and as soon as the weather will permit will remove tbem to the Pacific mill in this city, after which the Pacific mill will drop 20 stamps on ore from the Pacific mine. The company will continue to run the Key mill, making in all 35 stamps.

Organ Distaict.— Rio Grande *Republican*, Dec. 17: In the Bennett-Stephenson property development is constantly showing increased bodies of ore. There are now 4000 to 5000 tons of concentrating ores on the dumps of the Bennett and nearly half that amount on the Stephenson. The concentrator, which is constructed just helow the mouth of the tunnel, is approaching completion but will not be in shape to treat ore hefore the new year. It is a well-eqnipped and complete plant with a capacity of about 50 tons per day. Tramways have been constrncted so that ore can be landed in the concentrator at a minimnm cost. A hoist for working below the tunnel level is already on the ground. It was the intentiou to pnt in an engine uear where the hoist will be located, at the point where the tunnel intersecte the Bennett vein, but Col. Thornton has about concluded to use compressed air as the motive power and furnish it from the concentrator. Tbe outlook for the property appears very hright.

OREGON.

Coppea.—Rogue River *Courier*, Dec. 16: Capt. L. Burbridge returned from the Waldo copper fields last week after investigating the probable extent of ore out there. He thinks well of that country and will so report to the capitalists who sent him. He will take steps to have extensive prospecting done, and if the resnlt is satiefactory, smelting works will be set up out there. He is in the employ of the Pyritic Smelting Co. The Captain went to San Francisco Monday.

The St. Lawrence Ledge.—J. C. Hoar and S. P. Donglas have purchased the St. Lewrence mine of L. Higgins. This valuable ledge is three miles from Wolf creek and rich ore cen be traced the entire length of the claim—1500 feet. The lode avereges four feet in tbickness and the ore assays $40 to $400 to the ton.

SOUTH DAKOTA.

The Iron Hill and Seabury.—Deadwood *Pioneer*, Dec. 16: If the many valuable mining properties of the Hills which are at present heing operated at the minimum, for leck of railroad outlets, could only have proper railroad connection, how this conntry of hills and gulches and wealth of mineral would boom. The thought is brought out hy a brief cbat with Robert Cooper, of the Iron Hill property, uear Cerbonate camp. This miue, since coming into the hands of its present owners, has heen systematically developed and exposes at present fully 20,000 tons of low grade silver ore, good for from 20 to 30 ounces of silver to the ton and carrying from $2.50 to $4.00 of gold. There is the same trouble, however, that bas confronted the company for some time—a sbortage of lead, although recent developments show that condition as slightly improved. The work has been carried on for some months with a force of niue men, and within the present fiscal yeer, up to November, about 500 tons of ore was shipped to the D. & D. smelter, on which the return was as above indicated. The Iron Hill people have their own reduction plant, of 60 tons capacity, hut their ore does not carry snfficient lead to warrant operating the mill, and the distance for wagon transportetion—six miles to the F. E. & M. V. railway—brings any but pretty high grade ore below the line of profit. The condition which confronts the Iron Hill people also obtains in the Seabnry property, adjoining. Both companies have done extensive development work with about the same degree of encouragement, and which is considered very satisfactory for the progress made. The Seabury has shipped a good deal of ore to the D. & D. smelter, but not so mnch as has the Iron Hill. The return was about the same. The Seabury people hope to solve the problem by means of their diamond drill, which will extend their investigations to a depth of 1100 feet. Owing however to an error in shipment of a portion of the machinery, the drill cannot be gotten into operation much before January. Of course a good lead-bearing ore would be a grand thing for these mines to tep, hut what is really needed is a railroad outlet. If the lead dificulty could be overcome, the Iron Hill reduction mill would be started at once, and with its own and contiguous mines, would probably have all it could do; but in any event a railroad outlet is greatly to be desired, and it is gratifying to know tbat the prospects for the building of a line from the F. E. & M. V. to the mill are considered favorable. The route, over a comparatively easy grade, wes surveyed about a year ago, and since that time the Iron Hill and Seabury people have tried hard to secure the construction of the line, the advantage of wbich would undoubtedly be mutual on the part of the railroad and mining people.

UTAH.

A Tunnel.—Park *Record*, Dec. 17: From time to time during the past five years there has been talk of a grand consolidation of the many groups of mining claims on Treasure hill, the object being to drive a long tunnel from "Nigger Hollow" tbat would prospect the entire hill. The *Record* has spoken of the enterprise a number of times and called attention to the importance of such an undertaking and urged its consumation. It now seems that the enterprise is an assured fact and that early next summer will see operations commenced. The tunnel will be rnn from "Nigger Hollow" to the Silver King shaft, a distance of about 4000 feet, and will prospect the Kentucky, Mayflower, and Silver King ground thoroughly, and will undoubtedly expose several large bodies of ore. The tunnel will be equipped with an engine, air compressor and power drills from the Woodside, and once started, the work will he prosecuted vigorously. This enterprise and the Crescent tunnel will make matters lively in that section next summer.

Cyanide Process.—Park *Record*, Dec. 17: H. F. Geer, of the Columbia Mining and Milling Compauy, who are putting in a cyanide plent to work the tailings of the old Shoebridge mill in Tintic valley, is in town. He informs us that everything will be ready to commence on the tailings by Monday. The tauk has a capacity of 120 tons, and about 30 tons will be treated daily. The tailings contain from $10 to $12 in silver and gold, end they expect to extract 60 per cent of the silver and 90 per cent of the gold. It is estimated that there are 10,000 tons of the tailings. Papers were drawn in this city yesterday hy wbich Geo. C. Ross secnres a bond and lease on the Mammoth, a property lying between Copper and Spring gulches, Tintic district. By the terms of the contract, Ross is to do at leest 20 days' work on the gronnd each month, and pay a certain per cent of all ores shipped as royelty. The bond is for $50,000. The lease and bond expires Dec. 5th, 1893. Frank H. Clifton, A. M Wook and Rena Keate, of this city, are owners of the property. The Buckeye Mining Company, whose property is situated at the foot of Rising Sun mountein, south of Silver City, is in a very prosperous condition, and for a company very recently organized is making quite a record. Three shipments have already been made this fall, the last one of 13 tons arriving yesterday. The product is an iron ore, and the present shipment averages over 50 ounces silver and 1½ ounces in gold. The high per cent of iron it conteins makes it a very desirable fluxing ore. The company is at present operating with a windlass, hut has purchesed a steam hoist and will have it in operation soon, after which the shipments will be more frequent. Onr readers will notice with pleasure that the Centennial Eureka Mining Company has resumed the payment of dividends, and that on the 20th of this month $15,000 will be divided among its stockholders. Since its suspension of dividends last spring the Centennial Eureka has put up a magnificent hoist. There are large reserves of ore in the mine, some of it of very high grade, and the financial condition of the company is in excellent shape; all of which reflects great credit on the management of the affairs of the company, which has always been satisfactory to the sharebolders at large.

WASHINGTON.

The Oln Dominion Soln.—Spokene *Chronicle*, Dec. 14: The Old Dominion mine, near Colville, has been sold to Ferdinand Peck of Chicago for $100,000. Mr. Peck has been in Spokane for some time past, the gnest of Messrs. Dennis and Bradley, hut it was only known by a few of h s most intimate friends that he had the pnrchase of the Old Dominion under consideration. It is said the mine will now he worked on an extensive ecale, and that operations will be commenced at once. The bnsiness of the mine will be done throngh a corporation, of wbich G. B. Dennis, Cyrus Bradley and George Forster are the principal Spokane parties.

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Dec. 22, 1892.

SILVER—The same deplorable conditions surround silver that have been reported in these columns from time to time. The recess of the International Conference has distroyed all hope of relief directly from that source, though much is hoped indirecly from the discussion and general agitation of the quest on by the Conference In other words, its educational feature has been of value. Silver men now fear that the price may go even lower, though it does seem that the bottom has been reached.

QUICKSILVER—Market steady at quotations.

ANTIMONY—There is very little change to note. Sales are small and the market easy.

BORAX—The market is firm.

PIG LEAD—For two weeks there has been no notable change. Quotations are, however, a trifle higher, advancing a fractioo.

TIN—Nothiog new to report.

COPPER—Henry R. Merton & Co. report the stock of copper in Eogland and France and afloat thereto from Australia and Chili on the 1st December as follows:

	Price.	Tons
1890	£45 7s 6d	65,410
1891	41 2 6	57,620
1892	47 17 8	53,498

The quantity in sight on the 1st of each month in the past year has not varied much, the extremes being 59,738 tons August 1st to 53 498 tons December 1st. It is worthy of note that the price on the 1st of this month is higher than at the opening of any previous month this year and is £3 better than when the stock was the largest. James Lewis & Sons of Liverpool, sales of 20,000 tons in November at £45 8s 9d to £47 7s 4d. Since the 1st instant have eased off some in the Liverpool market. The quotation in that market on the 13th was £47 7s 6d. The situation is considered strong both in this country and in Europe. There have been large sales of Lake copper in Boston and New York in the past few weeks at 12c to 12½c. There is no doubt a speculative element present in these movements, though the legitimate demand is considered to be quite large and active. The promised decrease in the product of the Montana mines is also an element of strength in sustaining prices. The local market in San Francisco has a firmer tendency, in sympathy with better prices in the East.

COAL.—There was some talk of an advance by dealers to jobbers, but apparently it has not yet taken effect in the general market. Prices are low and likely to remain so for some time, unless there is a forced restriction of the output in the northern mines.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13½	English, lb	— @ 18
BORAX.		Canton tool	— @ 8½
Refined, in car lots	— @ 7½	B'k Diam'd tool	8½@ 16
Powdered, do	— @ 7½	Pick & Hammer	t½@ 10
Concentrat'd, do	— @ 6½	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE.**	
Bolt	22 @ —	B. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 6 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @11 75
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot	— @ 23
Narrwy, base	— @ 4½	**COAL.**	
PIG IRON.		**SPOT FROM YARD—PER TON.**	
	Spot.	Wellington	$8 00
Eglinton ton	20 00@— —	Greta	7 50
Glengarnock	21 00@— —	Nanaimo	6 50
Am. Soft, No. 1	22 50@— —	Gilman	6 00
Oregon Pig	—@—	Seattle	8 00
Puget Sound	—@— —	Coos Bay	5 00
Clay Lane White	22 00@— —	Cannel	8 50
Langloan	22 50@— —	Egg, hard	12 00
Thornoliffe	23 00@— —	Cumberland, in sacks	15 60
Gartsherrie	22 50@— —	Do, bulk	14 00
Barrow	22 50@— —	Wallsend	7 25
Carnforfleet	22 00@— —	Scotch Splint	7 60
CHROME IRON ORE.		Brymbo	7 50
Per ton	10 00 @— —	West Hartley	7 50
LEAD.		**TO LOAD—PER TON.**	
Pig	— @ 4½	Australian	6 25@— —
Bar	— @ 5½	Liverpool Steam	6 37½@— —
Sheet	— @ 6½	Scotch Splint	6 37½@— —
Pipe	— @ 6½	Cardiff	6 37½@— —
SHOT.		Lehigh Lump	15 00@— —
Drop, sizes *smaller* than		Cumberland	13 00@— —
B, ⅌ bag of 25 lbs	3	85 Egg, hard	11 00@— —
Do do, B and *larger* sizes		West Hartley	7 25@— —
⅌ bag of 25 lbs	2	10 **COKE.**	
Buck, Balls and Chilled		English, to load	8 50@ 9 60
do, ⅌ bag of 25 lbs	2	10 Do, spot, to bulk	—@10 00
QUICKSILVER.		do, in sacks	— @12 00
Home trade, pr. flask	41 50 @42 00	Cumberland	9 00@— —
For export	35 50 @36 00		

Eastern Metal Markets.

NEW YORK, Dec. 22.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.
Thursday	38¾	83
Friday	38¾	83¾
Saturday	38¾	83⅝
Monday	38¾	83¾
Tuesday	38⅝	82¾
Wednesday	37⅝	82¾

Board Sales of Mining Stocks.

THURSDAY, Dec. 22, 1892.

9:30 A. M. SESSION.

200 Bullion	80c	10 Occidental	30c
100 Challenge	35c	100 Opliir	1.05
100 Chollar	60c	300 Potosi	1.85
60 Con. Cal. & Va	1.60	50 Savage	90c
90 Eureka	15c	100 Sierra Nevada	1 20
100 Lady Washing'on	11c	10 Yellow Jacket	45c

2:30 P. M. SESSION.

600 Alpha	10c	1 0 Gould & Curry	50c
200 Andes	20c	100 Hale & Norcross	76c
60 Belcher	1.55	200 Kentuck	10c
50	15c	100 Ophir	1.00
50	1.60	60	1.55
150 Bullion	75c	100 Overman	40c
100	80c	50 Potosi	1.80
100 Obatlenge	30c	150	1.85
200 Chollar	55c	300 Savage	85c
200	60c	200 Seg. Belcher	20c
50 Confidence	1.60	400 Silver Hill	15c
600 Con. N. Y	60c	100	10c
340 Con. Cal. & Va	1.55	50 Sierra Nevada	1.20
60 Crown Point	55c	200 Union	1.10
300 Exchequer	15c		

MISCELLANEOUS SECURITIES.—Afternoon Sales — 200 Hawaiian Commercial, 50.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitore for Pacific Coast.

FOR THE WEEK ENDING DEC 13, 1892.

487,978.—CULTIVATOR—James Birch, North Ontario, Cal

488,066.—ROLLER BRAKE—H C. Finkler, S. F.

487,731.—SNATCH BLOCK—Geo. Harvey, S. F.

488 120.—CAR-COUPLING—Haub & Hashn, S. F.

488,076.—SWINGING CRANE—J. W. Kinsman, S. F.

487,753.—TRICYCLE—C. Koening, Stockton, Cal.

488,077.—HORSESHOEING APPARATUS—James Lamb, San Jose, Cal.

487 759.—INK ROLLER—R. W. Murphy, Seattle, Wash.

487,961.—AUTOMATIC WATER-GATE—G W. Norton, Yuma, A. T.

R 11,295.—REPEATING GUN—W. H. Ostrander, Merced, Cal.

488,085.—CLIP FOR WIRE ROPEWAYS—B. McIntire, S. F.

487,937.—PHOTO-PRINTING APPARATUS—U. S. Rush, Tacoma, Wash.

487,805.—TRANSMITTING POWER—W. E. Walsh, S. F.

The following brief list by telegraph, for Dec. 20, will appear more complete on receipt of mail advices:

San Francisco—John B. Houston, piston-rod packing; Robert D. Hume, can-body forming machine; Auscn L. Munson, antifouling paint; John W. Raymond, gas engine; Maud Wyman, slate attachment. California—John H. Gregory, loue, wrench; James McDonald assignor of one-half to M. McDonald, Los Angeles, feed water-heater and purifier; Orrlugs Lard Los Gatos, animal trap. Washington—Sidney A. Lake, Lakeview, nut lock; William H. Norris, Spokane, non-beat-conducting covering.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Mining Share Market.

There is little of interest in the mining share market, prices continuing low. The fifty cent assessment on Cons. California and Virginia has given stocks a worse setback than anything that has happened for some time. The assessment is due to the condition of affairs in the mine, which, through the breaking out of the gas in the lower levels, has been almost entirely shut down. The company is also in debt to the amount of $41,000. The Con. Cal. & Va. has been a wonderful piece of mining property. Prior to consolidation 13 assessments were levied on the California, aggregating $1,104,000. On Con. Virginia 20 assessments were levied, amounting to $1,155,900. Since the consolidation in 1885 two assessments were levied on the joint stock, aggregating $108,000—making the entire amount collected in assessments on the property $2,368,900.

The old Con. Virginia before consolidation with the California disbursed in 53 dividends to stockholders $42,930,000. The 34 dividends disbursed by the California aggregated $31,320,000. Since the mines have been consolidated $3,628,000 has been disbursed in dividends, making a grand total of $77,878,000 paid out.

A special meeting of the stockholders of the Pacific Coast Borax Company has been called for February 18, 1893, to consider a proposition to increase the capital stock from $1,500,000, divided into 1500 shares of $100 each, to $2,000,000, divided into 2000 shares of $100 each.

The Mayflower Gravel Mining Company paid a dividend of 25 cents per share on the 15th. The company has a large surplus. Hereafter monthly dividends of 10 cents per share will be paid, and extra dividends will occasionally be declared out of the surplus.

The Great Western Quicksilver Mining Company has declared a dividend of 25 cents per share, payable immediately.

The Champion Mining Company of Nevada county has declared a dividend of 10 cents per share, payable December 19th.

At the regular annual meeting of the stockholders of the Ophir Mining Company 88,200 shares were represented and the following officers elected for the ensuing year: Charles H. Fish, president; Nat T. Messer, vice-president, and A. W. Havens, George R. Wells, William S. Lyle, Herman Zadig and C. O'Connor, directors. E. B. Holmes was re-elected secretary and D. B. Lyman superintendent. The secretary's financial statement showed an overdraft of $4032 16. The superintemdent's annual report shows that there has been extracted during the year from all parts of the mine, 698 tons of ore. This quantity, added to the 247 tons which remained in the orehouse at the date of the last annual report, makes a total of 945 tons, all of which was milled, part at the Eureka mill and part at the Mexican mill. From all this ore there has been produced bullion of the assay value of $15,609.89, which shows an average yield of $16.51 per ton. The bullion carried $6600 41 in gold and $9009.48 in silver.

At the annual meeting of the stockholders of the Kentuck Mining Company $60,229 shares were represented and the following officers elected for the ensuing year: R. E. Kelly, president; H. Zadig, vice-president; and W. H. H. Hart. Sol Jacobsand A. Waterman, directors. A. Waterman was elected secretary, vice J. W. Pew, and J. H. Kinkead superintendent. The financial statement showed a credit of $2854.66.

At the annual meeting of the Gould & Curry Mining Company 85,151 shares were represented, and the following officers elected: H. B. Havens, president; Charles H. Fish, vice-president, and Herman Zadig, Thomas H. Fish, J. N. Souther, Thomas Anderson and Robert Sherwood, directors. A. K. Dunbrow was reelected secretary, and P. Kirwin, superintendent. The secretary's financial statement showed an indebtedness of $9055.79. During the year there was milled at the Occidental mill 500 tons of ore, 287 tons of which were extracted from the old stopes on the 200 and 400 levels, the balance being on hand in the orehouse from the previous year. The assay value of the bullion obtained from this ore was $5935.28. Average battery assay, $18.78; percentage of the battery assay obtained, 63 2-10 per cent.

At the annual meeting of the Andes Mining Company 96,144 shares were represented, and the following officers elected: Nat T. Messer, president; L. C. Fraser, vice-president; William S. Lyle, C. O'Connor and H. Zadig, directors. J. W. Twiggs was reelected secretary and Joseph R. Ryan, superintendent. The secretary's financial statement showed a credit of $3978.86.

At the annual meeting of the stockholders of the Mount Diablo Mining Company 32,746 shares were represented, and the following officers elected: J. M. Shotwell, president; J. N. Knowles, vice-president, and G. W. Grayson, Louis Teese Jr. and R. W. Heath, directors. R. W. Heath was reelected secretary and his financial statement showed a credit of $5192.62.

At a special meeting of the Union Con., C. C. Harvey was elected secretary, vice A. W. Barrows, deceased.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ROLLER BRAKE.—Henry C. Finkler, S. F. No. 488,066. Dated Dec. 13, 1892. It consists of a roller adapted to rotate with or upon a shaft, and having adjustable frictional endplates by which the pressure upon the roller may be regulated and the amount of friction upon the contacting surface increased or diminished. The object of the invention is to provide a braking device in which the wearing friction is removed from the contacting surfaces which are less liable to damage or constant wear and which are easily removed at any time, and it is especially applicable for use upon brakes which are applied to surfaces easily injured, as in the case of rubber bicycle tires, wire cables, ropes and other similar surfaces.

HORSESHOEING APPARATUS.—James Lamb, San Jose. No. 488,077. Dated Dec. 13, 1892. This invention relates to that class of apparatus designed to receive, hold and support a horse during the operation of shoeing. The object of the invention is to provide an apparatus of this class adapted to easily receive the horse and hold him firmly, at the same time supporting him thoroughly with comfort to himself and safety to the operator.

SWINGING CRANE.—James W. Kinsman, S. F. No. 488,076. Dated Dec. 13, 1892. This is a swinging crane for loading and unloading vessels and other carriers, and for removing and depositing material. The crane is easily operated and so simply constructed that there is not liable to be confusion or complication in its use.

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Bradshaw M Co	Annual	H P Bush, 430 California	Dec 24
Bullion M Co, Nevada	Annual	R R Grayson, 331 Pine	Jan 12
Ophir M Co, Nevada	Annual	E B Holmes, 309 Montgomery	Dec 27
Pacific Coast Borax Co, California	Special	A H Clough, 103 Sansome	Feb 18
Poor M Co, Arizona	Annual	A Waterman, 309 Montgomery	Dec 29
Peerless M & M Co, Arizona	Annual	A Waterman, 309 Montgomery	Dec 29
Weldon M Co, Arizona	Annual	A Waterman, 309 Montgomery	Dec 29

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Bulwer Cons M Co, California	5	L O Osborn, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 310 Pine	Dec 19
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Mayflower Gravel M Co, California	25	D M Kent, 330 Pine	
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Table of Contents.

The following brief abstract of the contents will give an idea of the branches of the subject treated:

General Plan; Discussion of the Principles of Hydraulics; Rules Deduced from Formulæ Obtained; Examples and Calculations; Extensive Tables for Ready Reference; Fundamental Laws of Hydraulics Demonstrated and Expressed in Formulæ and Rules; Flow of Water through Openings; Weir Coefficients; Triangular Weirs; Flow of Water Over Quadrant Weir (tabulated); Application of Tables; Submerged Orifices; Flow Through Orifices in Thin Partitions; Tables and Applications; Miners' Inches; Tables and Calculations; Flow of Water Through Short Tubes and Compound Tubes; Flow of Water Through Pipes; Tables of Velocities and Cubic Feet Flows for Given Fall per Mile and Diameter of Pipe; Coefficient for Bend—Circular and Angular; Flow Through Nozzles; Inverted Siphons; Flow or Water in Open Channels; Extensive Tables; Rough and Ready Notes; Hints for Speedy and Approximate Estimates, etc.

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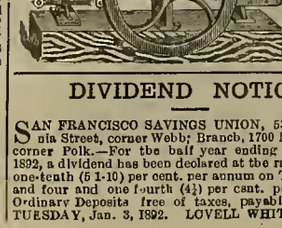

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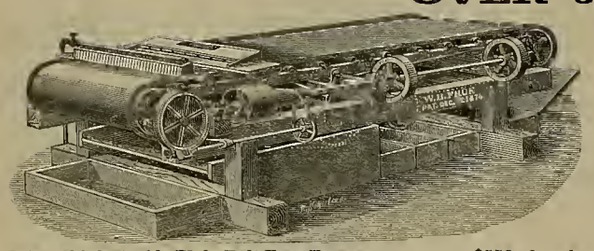

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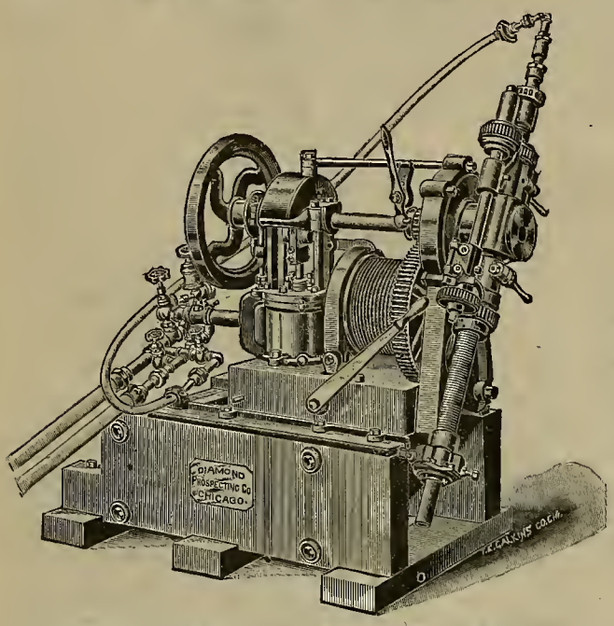

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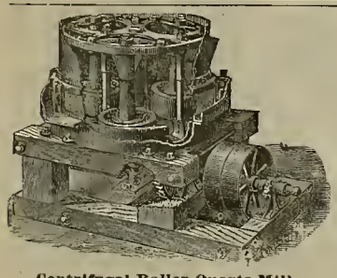

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SAN FRANCISCO, SATURDAY, DECEMBER 31, 1892.

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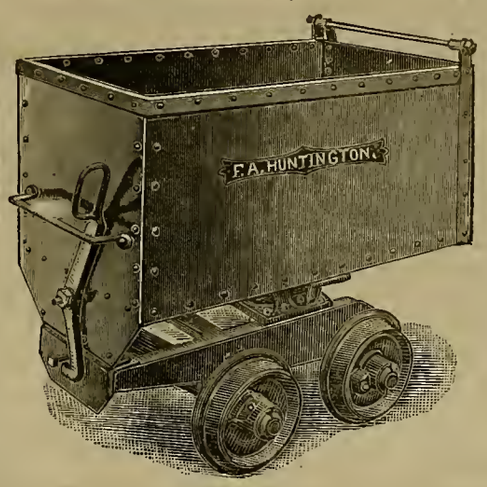
Reduction of Ferric Sulphate in Volumetric Analysis.

The difficulties attending the reduction of ferric sulphate in the determination of metallic iron by the method of Marguerite are often serious, and affect time, patience and accuracy. They depend upon the condition and purity of the zinc used, the state of saturation of the solution, acidity and temperature. There is a preference for the Marguerite method in determining metallic iron for several reasons. Only facilitate the reduction of the ferric sulphate and it is the most valuable of all methods, combining the utmost rapidity with the highest accuracy attainable. There is no difficulty in obtaining iron as ferric sulphate; but the reduction of this to the ferrous state has hindered the precision of the permanganate method. Discrepancies are all to be set down to the errors introduced in the reduction with zinc.

Mr. Clemens Jones, of Hokendaqua, Pa., wrote for the American Institute of Mining Engineers some time since, a paper on "A Rapid Method for the Reduction of Ferric Sulphate in Volumetric Analysis," in which he showed that a solution of ferric sulphate is instantaneously and completely reduced by filtering through pulverized zinc. The apparatus designed by him for the rapid reduction of ferric solutions is shown in a cut on this page.

It consists of two cups, A and B, of about 300 c.c. capacity, the outlets of which connect alternately, by means of a 3-way cock C, into the joint-tube D. This tube is provided with a packing space *d*, which is filled with an asbestos roll, kept in place by a ring of cork. The tube moves up and down freely. At its lower end *e*, it is ground to fit the detachable tube E. This is for the pulverized zinc, and at its lower end has a stopper *f*, ground to fit the titrating flask F, of about 700 c.c. capacity. The stop-cock G connects with the vacuum pump. The tube E is disconnected by pushing it up, grasping the neck of the flask with one hand, removing with the other the round block which supports the flask, and then detaching the flask F. The tube E now rests on the little shelf shown in the cut. This is drawn out, and frees the tube at its ground joint *e*.

A wad of fine glass wool, sufficiently thick to make a good filter, is inserted in the tube, and the pulverized zinc is filled over this, for four-fifths the length of the tube. This holds about 300 grammes, which is enough for 60 filtrations. The tube is then replaced by reversing the manner of removal, connection is made with the filter-pump, and the apparatus is ready for use. It is first necessary to wash the column of zinc with dilute sulphuric acid. This acid is made up of one part of acid of 1.84 sp. gr. to two parts of distilled water, and is used throughout in all work upon iron determinations. Of this about 30 c.c. is taken, transferred to the cup A and diluted to 50 c.c. The stop-cock G is opened for suction and then the 3-way cock C is turned to discharge the cup A. A vacuum of five to six pounds, or more, gauge indication, must be used, since the large volume of disengaged hydrogen retards the filtration. The cup and column of zinc are then washed free from acid by fine rinsings. This operation is repeated four times and is then finished for this tubeful of zinc. The same procedure is adopted to reduce a ferric sulphate solution, except to use both cups, A and B. After the first is emptied it is washed five times. This incidentally cools the column of zinc and retards unnecessary solution. The other cup is then connected by turning the 3-way cock C, and washed in like manner. In each case this suffices to free the apparatus from all traces of iron or sulphuric acid. G is then closed, the 3-way cock is turned again to relieve the pressure, and the flask is removed. Time for reduction, two minutes.



THE HUNTINGTON IMPROVED ORE CAR.

(*See page* 427.)

FIG. 1.

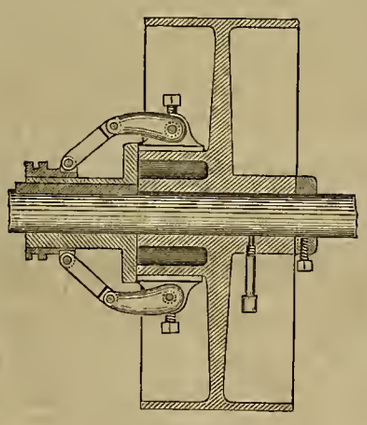
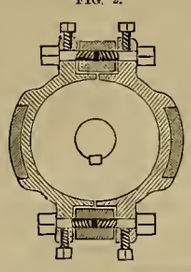
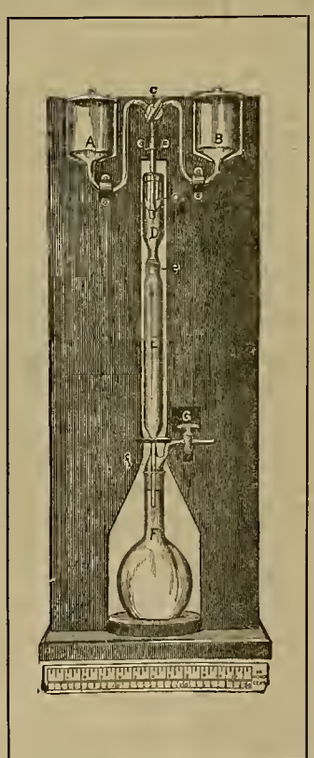


FIG. 2.



THE BARNES SCREW LEVER FRICTION PULLEY.



APPARATUS FOR REDUCTION OF IRON SOLUTIONS.

Barnes Friction Clutch Pulleys.

The accompanying cuts represent the principles of one of the latest improvements in the line of friction clutch pulleys and cut-off couplings manufactured by the J. H. & D. Lake Company, of Hornellsville, N. Y. Fig. 1 affords a sectional side view of the Barnes screw lever friction pulley in released position, showing the driving hub keyed to the shaft.

Fig. 2 is a sectional end view describing the friction hub encircled by friction-ring, the former of which is cast in one solid piece with the pulleys. Projecting lugs on opposite sides of the driving hub of the ring drop into lugs, or lug cavities, of the friction-ring, and when the clutch is on these lugs take all the driving power. This is an improvement over the old bolt fastening system, the bolts of which are more liable to be affected by the twisting strain upon the hub from the friction of the clutch. At the extreme top and bottom of Fig. 2 is shown a view of a simple device which evades the use of much complicated machinery, and more than substitutes the corresponding complex parts of some previous inventions. It is a lever nut on each side of the friction-ring, one-half of the nut being cut with a right thread and the other half with a left thread. Sufficient space between opposite sections of the ring is given for contraction or clutch, which is affected by means of right and left thread screw-bolts entering the lever nut from opposite sides, secured by set-screws. Duplex levers are attached to these nuts at their upper section and to the hub at their lower section. When the shipper sleeve is thrown against the flange by the operating lever, the duplex lever turns the nut sufficiently to produce a friction that was never known to lose its grip, nor has a thread of these screw-bolts ever been known to break. The screw-bolts are adjustable to any desired pressure, however, in case the clutch should ever become lax. They give the pulley a positive grip and absolute release from the hub by each opposite shift of the operating lever, without the use of springs. The Barnes screw lever friction clutch pulleys and cut-off couplings are adapted to both heavy and light work.

A CORRESPONDENT of an Eastern exchange asserts that the possibilities for a considerable advance in copper were never greater than at the present time. This may be fairly inferred from the fact that copper is now exported at even higher figures than rule in this country, and the tendency of the foreign market is still upward. One of the most important factors in the consumption of copper is the electric railroad business, which, should the developments expected during the ensuing year materialize, has a brilliant prospect before it, such as will be unprecedented in the history of electric railway building.

IN MONTANA the copper ore is combined with sulphur, antimony and arsenic, and it requires a long series of smelting operations to secure pure copper, so that ten per cent ore there is no more profitable than four per cent ore at Lake Superior. The Montana mines have, however, an advantage in the fact that one-third of an ounce of silver goes with every per cent of copper,

MINING AND SCIENTIFIC PRESS.

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ALFRED HOLMAN ..... MANAGER

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Comment.

An example of cheap mining work is shown by what was exemplified in the month of November at the Seven Stars mine, Hillside, Arizona. No. 2 level, north, was extended 40 feet by one man at $2 50 per foot; total distance 334 feet. No. 3 level, north, extended 32 feet by one man at $2.50 per foot; total distance 624 feet. No. 1 level, south, extended 51½ feet by one man at $2 50 per foot; total distance 531 feet. No. 2 level, south, extended 61 feet by two men at $2.75 per foot; total distance 1158 feet. No. 4 level, south, extended 52 feet by two men at $2.75 per foot; total distance 153 feet. The seven men averaged for the month, 34 feet. The maximum wages are $3.50 per day, though the contractors expect to make $4 per day. Mr. T. A. Rickard, the manager, informs us that the lode is a nearly vertical vein, cutting through a nearly horizontal talc schist. The layers of quartz are two to six inches thick, and separated by thin seams of talc. The ground drills fairly hard, but breaks very readily. In the other mining work the rises cost about $2 per foot; winzes $3 to $3.50 per foot, and crosscuts $2 to $3.50 per foot. All this is remarkably cheap work in mining operations.

While numbers of parties have gone to the diamond fields (?) in Idaho, it is pretty certain that the whole excitement about the gems was on a false basis. It is even believed by some that the ground has been salted. The surface of the basin is bestrewn with shiny pebbles and quartz gravel, and several ignorant men have eagerly gathered up large quantities of the worthless stones. Even if diamonds were to be found in the basin, water for washing them out could not be obtained unless brought from Snake river at a cost of at least $4,000,000. Nearly all the basin land has been located, and claims have been staked out more than three miles from the basin. The land is located as placer ground, each claim being 15 acres in extent. None of the men know anything about diamond mines, and the experts (?) only spent an hour or so at the basin. They then had work stopped at the "ledges," and went off to Chicago to organize a stock company. All this sounds rather fishy. If Mr. Kunz is the expert he is reported to be, he would scarcely talk about "diamond ledges" in that off-hand way, because they do not get diamonds in ledges. Moreover, it does not look very well for him to make an agreement not to do any more work on the "diamond ledge" until he returns from Chicago, where he has gone to organize a stock company. If as rich as reported, no stock company is needed to open the fields. It should be borne in mind that this Mr. Kunz is not George Frederick Kunz, the gem expert of Tiffany's, New York, and the author of a standard work on Gems and Precious Stones. If any stock company is formed, our advice would be for people not to buy any stock for the present. We had a little experience of this kind in California once, which ended disastrously to all except the stock promoters. Mr. Kunz may know something of cut diamonds, and nothing of diamond-mining. A jeweler is not apt to know so much about how they mine precious metals and gems as about preparing them for sale. Stopping work in the ground and rushing off to start a stock company is not going to create any great confidence in the new-discovered fields.

The Caminetti hill will come up in the Senate shortly after the holidays. Ex-Representative C. P. Berry is already in Washington in the interest of the anti-debris people trying to get a penal clause attached to the hill. As the bill only permits hydraulic mining under certain conditions, and the present sections provide penalties, it is not clear what additional measures he needs. It is clear, however, that the miners must again send a delegation to Washington to look out for their interests. The miners only want what is fair; that is, permission to run their mines if they can do it without injury to other interests. The miners of this State must put their hands in their pockets and send some more money to the Executive Committee of the State Miners' Association to permit them to send one or more persons to Washington to look after this hill. It will not do to neglect this. The Caminetti hill has already passed the House and Senator Felton will help it through the Senate; but *personal* assistance from the Miners' Association is necessary and should be given at once.

THE current volume of the MINING AND SCIENTIFIC PRESS closes with this number. The index on the last page indicates the wide scope of the subjects treated during the last half-year, and should be an assurance to those engaged in mining or other industrial pursuits on this coast, that all their interests have received due attention. The miners on the Pacific Coast should not only aid the editors and publishers by their subscriptions, but also by sending notes of such matters as may be of interest and value to fellow-craftsmen. All will be mutually benefited by such a course. The information published in the last six months has been of the greatest value to the miners and millmen who take the PRESS. The iron workers and electricians, and all others engaged in industrial enterprises of any kind have not had their interests neglected since we have endeavored to give their departments full attention. It is desired to still further improve the PRESS, for which purpose the hearty co-operation of its readers is needed. The editors are always pleased to receive communications which may be of general interest, and during the coming year it is hoped many of them will come to hand.

Building Government Vessels East and West.

It would seem as if some arrangement should be made by which the Navy department could award the contract for one of the new vessels to the shipbuilders of the Pacific Coast. It is true that the Cramps of Philadelphia put in the lowest bids on both of the proposed vessels, and that the bid of the Union Iron Works of this city was too high. The difference was very small, however, and efforts are being made to get Secretary Tracy to divide the work, and have one ship built on the Atlantic and the other on the Pacific Coast. The contracts will not be awarded for a week or so, and it is understood that the Secretary of the Navy has asked the opinion of the Attorney-General as to his right to award the contract to any but the lowest bidder. Mr. Irving M. Scott, of the Union Iron Works, is in Washington, and is still hopeful he will get one of the vessels to build. The Government should make a difference between the East and West in shipbuilding contracts on such a basis as will give the builders on this Coast a chance for the work. Coal, iron and labor are cheaper there, and transportation rates westward are high.

It should be the policy of the Government to encourage extensive shipyards on the Pacific shores. It ought to be glad to have an institution maintained by private individuals ready to build or repair its ships on any scale. An immense establishment equipped with expensive tools and appliances is ket in working order at no expense to the Government. Skilled mechanics make their homes here ready to undertake the Government's work. There should be some percentage established which would permit shipbuilders on the Pacific to bid against Atlantic builders without loss and with some hope of success. It is a trip of many thousand miles around Cape Horn, and Government vessels must be kept here as well as East. If the difference in cost of building here, and bringing a ship around the Horn, could be deducted from the bids, there would be more chance for our local builders. But even with the smaller vessels of the Coast Survey, Lighthouse or Revenue Service, all must bid on the same basis. The result is most of the work goes to the East, even if the vessel is for use here; but by the time she gets on her station she costs $10,000 or $15,000 more than the local builders bid to construct her.

The Mare Island Navy Yard is not fully equipped for building large vessels for cruisers or fighters; yet the Union Iron Works are. Still, if the Government offers no encouragement to these works, they cannot be successfully maintained for building warships. The occasion may come at any time when a fine shipyard like this would be a vital necessity to our Government; yet to save ten or fifteen thousand dollars on a million-dollar contract, it gives all the work to one shipyard having already plenty to do, and leaves out in the cold another yard—the only one on the Pacific Coast of the United States. This state of affairs ought to be remedied, and at once. There must be some way by which justice can be done to both sides of the continent and the work distributed among the mechanics of both the Atlantic and Pacific Coast.

Foundry Notes.

The complaint of dull times is universal among the foundrymen. None of the shops are running full-handed at present and orders are comparatively few. With the advent of spring, however, better business is looked for.

The Joshua Hendy Machine Works have received of late a number of letters from the Australian colonies asking for detailed information and figures concerning the hydraulic gravel elevators in use in California. The Hendy Co. own the patents on this device, and are the only manufacturers. There are numerous places in Australia where gravel elevators will be especially useful, mainly, of course, in such claims as have insufficient fall where the ground is low.

Albert H. Stahl, who has been stationed at the Union Iron Works for some time past, has received an order from Washington notifying him of his appointment as United States Naval Constructor, to oversee the completion of the Monterey, Olympia and Oregon, now under way at the Union Iron Works. Naval Constructor Stahl is one of the youngest, if not the junior, of the fourteen naval constructors in the service. In addition to that responsible office, he is inspector of cellulose, member of the board of inspection for the inspection of war vessels, and a member of the board to prepare plans for the construction of merchant vessels so as to fit them for acting as an auxiliary to the United States naval forces should an emergency arise that would require their aid. Mr. Stahl served for two years at Cramps, Philadelphia, and then, after a visit to Europe on naval business, came to this city as assistant naval constructor. He has for some time been acting as full U. S. naval constructor, but his official appointment to the position was only received this week.

A. P. Brayton, of the Pelton Water Wheel Co., went to New York this week on a business trip.

Mr. Lacy, of the Parke & Lacy Co., has returned from Australia, where he has been for the past eight months. The firm has a branch house in Sydney, where a large business is done in mining machinery.

The Pacific Coast Steamship Co.'s steamer State of California has been on the dry-dock at the Union Iron Works nearly a month having new plates put in her bottom and undergoing a thorough overhauling. She came off the dock this week. The U. S. Coast Survey steamer Patterson has also been undergoing her annual overhauling at the Union Works.

A. P. Brayton has just returned from Colorado, having passed most of his time at Aspen, where Pelton wheels have been put at work operating the dynamos for a large electric power plant.

The Risdon Iron Works are building two four-foot sectional Bryan mills for the Candelara mine in Mexico. This mine already has four of these mills. These works are also figuring on an installation of four Bryan mills and another of seven, These will be equal to plants of 60 tons and 100 tons respectively. A five-foot Bryan mill has just been sent to the Phœnix mine in Butte county.

Wm. Lakin, as administrator of the estate of James M. Thompson, has brought suit against Ira P. Rankin and his former partner, A. P. Brayton (Pacific Iron Works) for an accounting of the profits of a business conducted under a contract between Thompson and John Howell on the one side and the firm of Rankin, Brayton & Co. on the other. The contract was executed in 1865, and under its provisions the defendants agreed to manufacture certain patented rotary furnaces, the patent for which was owned by Thompson and Howell. Lakin alleges that Rankin and Brayton violated the terms of the contract, Lakin has demanded an accounting, but has not been able to secure one. He says the books are in the possession of Rankin,

hut in such a mixed and uncertain state that Rankin was unsble to extract from them any definite informstion. Lakin believes that under a full accounting he will be entitled to a judgment against the defendsnts for about $15,000. Anyhody who knew James M. Thompson will wonder thst he died leaving any uncollected accounts or that anyhody would get tbe hest of him in money matters. Tbe Pacific Iron Works huilt many of these furnsces and Thompson was paid hy the pound, the furnaces averaging about the same weight. On one occasiou he found one to weigh differently from tbe average, and on this hased tbe claim on which this suit is started. Mr. Brayton sold out of the Pacific Iron Works some years sgo, and the works have since closed out altogether; but in dissolviog tbe partnership Mr. Rankin assumed all the responsibilities, so that Mr. Brayton himself is not interested in the resu't of this suit.

The unofficial tests of the coast-defense vessel Monterey have heen continued this week. On the trial of Tuesdsy the speed was gradually increased until the maximum of 157 revolutions wss resched and a speed of 14 knots an hour attained. On the last trial prior to this one the revolutions of the propeller resched 130 and the speed 12¾ knots (estimated), but even at the incressed speed the engines and machinery seemed to sct with as much smoothness, and with even greater effectiveness, than ever before. The results thus far lead the builders to expect a good honus for the horse power developed over the requirements. The pitch of the propeller blades is to be chaoged, hut this can be done very easily from the manoer in which the wheel is constructed. After another test with the new pitch of tbe screws the final trial will be made. The Wsrd tuhular boilers in use on this vessel hsve proven very successful.

The Huntington Ore Car.

As mining cars are usually made, the frsme and axles are rigid. There is seldom more than three wheels taking weight at the same time; in fact, two wheels must tske nearly all the weight at all times, unless the track is ahsolutely level, which is seldom the case. A small rock or other obstruction is lisble to lift a wheel on the opposite side clear ahove the track, often causing accidents. The Huntington ore car, illustrated on page 425, is constructed with one rocking axle, so that, like an ordinary wagon, the load is at all times equally distrihuted on all the wheels, thus avoiding derailment, making the csr move easier, and saving the frame from great strain.

This car hss just heen patented hy Mr. F. A. Huntington, of this city, inventor and maoufacturer of the well-known Huntington roller mill. The car will stand or travel on all its wheels irrespective of the unevenness of the track due to obstacles thereon or other causes. The hody of the car is mounted on tbe frame and is adanted to be manipula'ed in the usual maoner. One axle is secured to the frame in the ordinary way. The other axle is connected with the frame by a pivotal joint arrang•d in sucb a msnner that it can rock or tilt in the direction of its length. Tbe result is that no matter how uneven the surface may he on which the car is standing or traveling it will rest or travel squarely on four wheels and can he easily moved, and the load will always be equalized.

It is tbe opinion of Dr. Edward Peters, the copper expert, who went to Australia on the last steamer, that all the accessible copper mines in the Uoited States have probably heen found. A copper deposit cannot keep itself concealed unless it happens to lie at a great depth. Ordinarily it is traced by the stain it leaves on the surroundiog country. The thoroughness with which the United States has been traversed hy mining men and metallurgists leaves little scientific doubt that all existing copper mines lying anywhere near the surface of the ground have been opened up. With due deference to Dr. Peters' opinion, however, it should he horne in mind that there are great areas of the mountainous region of the West which have scarcely heen prospected. There are hundreds of places where copper stains and indications have been noted, hut which have never heen prospected simply because they are too distant from railroads, etc., to make it worth while to bother with them for the present.

MINERAL EXHIBIT. — Secretary Thompson of the World's Fair Commissin has received notification that the allotment of space has heen made for the California mineral exhibit. The space is on the ground floor and occupies a desirshle position, fronting the central aisle, and is 60x37 feet, thus aggregating 2220 feet. Many gentlemen interested in mining have promised to loan their cahinets, and the State Mining Bureau will contrihute largely to the display.

CRIPPLE CREEK, Colo., is strictly a gold camp. The district is about six hy twelve miles and mining and prospecting is going on all over the district. The lesds range from three to twenty feet in width, and the general average of the ore is from $16 to $20. There are five or six mills in operation, and a number of others are being put up. Two railroads will he completed to the camp hy March. The camp is located eight miles from Pike's Peak, and ia best reached from Colorado Springa.

Mining Briefs.

ACTIVE work has been resumed on the famous Keystone mine, Amador county.

FIVE HUNDRED AND NINETY-TWO delegates attended the El Paso Silver Convention, representing 24 States and Territories.

OUR exchanges contain numerous accounts of good strikes beirg made in doing assessment work on claims this winter. That's the way to make strikes on clsims; do some work on them.

THE Nevada county *Transcript* says that the mines of that district are looking well at present. In three of them the ledges are larger and richer than ever known before, and this month's shipment of gold from them will exceed any previous month.

DIAMONDS are supposed to he among the other valushle products of Inyo county, and it is whispered that a prospecting party will soon make a thorough investigation. Tbey are found in several parts of California, but so small as to he of no commercial value.

THE stockholders of the Idaho Quartz Mining Compaoy, of Grass Valley, have held their annual meeting and re-elected the Bosrd of Directors, as follows: Edward Coleman, John C. Coleman, Eugene C. Oreller, George W. Hill and Myles P. O'Connor. The Board organized hy electing Edward Coleman, President; E. C. Creller, Vice-President; George W. Hill, Secretary; J. C. Colemsn, Treasurer. Edward Coleman wss elected superintendent.

MR. GUY H. REYNOLDS, superintendent of the Cave Creek onyx mines, Arizona, stopped work on the mines until April, professing to believe that the incoming administration will reduce the tariff on onyx and thus close its mines permanently. Perhaps a hetter reason for closing down was tbe severe winter weather in the Cave Creek region. It will he time enough to quit mining for onyx when tbe foreign material crowds out the home product, or is placed in a position to do so.

THERE is little doubt that the finds in the gold fields in southern Utah have been exaggerated. Some California miners who were smong the first to go on have returned to Albuquerque. They think there is gold there and that it will eventually become a good camp, hut all those who are now rushing in expecting to gather up gold by hsndfuls will be seriously disappointed, and very hard times are in store for them. There are at least 1000 men already in the new camp and practicslly nothing is heing done except hy tbe Arizona and Utsh Mining Company, which has located all the best ground. The westher is cold, provisions are enormously high, and, although a color can he found anywhere in the sand, a msn cannot pan out half enough to pay his hosrd. Hundreds of people now there are anxious to work for the company, doing the most disagreeable kind of labor at very low wages to get enough to take them home. There has already been a fight over claims in the district, during which several men were killed. George Ferguson, an old prospector, and James Cody, known as "Blind Jim," one of the hest known chsracters in Arizona and New Mexico mining camps, were among the slain. Numbers of men are still going into the new fields.

Coast Industrial Notes.

THE had weather has interfered considerably with the construction of the Alameda electric railway, hut the projectors say they expect to have the Santa Clara avenue and Park street lines running by electricity as early as April 1, 1893.

THE last seven of 265 cases of machinery for the new jute mill at San Quentin, which arrived on the British ship Formosa on December 1st from Liverpool, were shipped across the bay last week. The value of the machinery is $25,000.

THE San Francisco Ship Caulkers' Association has elected tbe following officers for the ensuing term: President, James E. Connolly; Vice-President, John Comyns; Secretary, Thomas F. Mangan; Treasurer, Lawrence Comyns; Sergeant-at-Arms, John Roherts; Trustees—Rohert T. Delano, Henry P. Sexton and Stanford M. Taylor.

WILLIAM L. MERRY, A. B. Field, C. H. Haswell, Jr., J. J. Moore. H. Bendel, William Thomas and Frank Datton are named as directors of the North American Navigation Company, for which articles of incorporation were filed on the 22d inst. The object of the corporation is to carry on the business of common carriers hetween San Francisco and Panama and elsewhere. The amount of capital stock is $3,000,000, divided into 30,000 shares.

THE Street Committee of the Board of Supervisors has agreed to report in favor of the final passage of the Le Roy railroad franchise for a road on Montgomery avenue, from Kearny to Powell streets; Mason street, from Bay to Jefferson and Powell; Bryant street, from Twenty-sixth to Precita avenue; Twenty-sixth street, from Folsom to Howard; San Bruno road to the county line; Post street, from Broderick to First avenue; Broderick street, from Ellis to First avenue, etc.

A MEETING of about 50 sub-contractors and material men was held in the rooms of the Builders' Association this week to decide upon an amendment to the mechanics' lien law whereby an employee or sub-contractor may be protected against loss. After much discussion it was decided to suggest an amendment to the law at the coming session of the Legislature recommending that contractors furnish bonds for half of the value of contracts they take. By this means it is believed employees will be assured of receiving wages due them.

A FEW miles up Ventura avenue, from this place, says the *Ventura News*, is said to exist a fine deposit, or several of them, of pottery clay. A clay so fine and so pure as to he equal to the hest of that article, used in making earthenware, crockery, and kindred nther articles sn much in use. It is so plentiful that the wonder has been expressed that some one of enterprise has not taken it in hand long before this, and turned it to account. A great industry could be started here that would give employment to many men and draw much capital to this place.

THE Chamber of Commerce of Phoenix, A. T., will hold a meeting at an early day to confer with a committee of 100 appointed by the Chamber of Commerce of San Diego relative to a proposed railroad between the two points. It is proposed that the new road cross the Colorado at Yuma, and come by the Harqua Hala gold mines of Arizona. By the existing law of Arizona the road would be exempt from taxation for twenty years, and as soon as the Territory is admitted it is proposed to bring a pressure to bear on the Legislature for a honus. Prominent Denver men are interested.

THE California Sash, Door and Blind Company, the largest establishment of the kind on the Coast, is located at West Oakland. It has an office and salesroom in Oakland as well as in San Francisco. Its warehouse is at the factory, from which stock is distributed. A side track runs to the rear of the factory. A second story is being added to the brick warehouse, which is to be 222 by 56 feet. The site at West Oakland was selected from many offered as best suited for the purposes of manufacture and the facilities for receiving material and the distrihution of the articles manufactured.

ARTICLES of incorporation have been filed with the Secretary of State for an electric railroad to run between Pacific Grove, Monterey und the Hotel Del Monte, a distance of ahout five miles. The name of the corporation is the Pacific Grove, Monterey and Del Monte Electric Railroad Company. This company has bought up the rights and privileges of the old Monterey and Pacific Grove Horse Car Company, owned by one Juan Malearin and purchased of him for $75,000. The members of the present corporation own the Electric Light and Power Company and consist of J. T. Macrossan, secretary and treasurer of the Atlas Iron Works; H N. Bryant, manager of the Bank of Pacific Grove; A Barnard, connected with the Title Abstract and Trust Company; Montford W. Bell, secretary of the Carnall-Hopkins Company; William H. Chapman, an attorney of this city; and George W. Hopkins and Nathan C. Carnall, of the above-mentioned real-estate firm. The president is J. T. Macrossan, William H. Chapman secretary, and George W. Hopkins treasurer. Ten per cent ($50,000) of the capital stock has been actually paid in. The promoters intend to have this line running in about three months.

THERE is a steady increase of the freight shipments at the Sixteenth street station in Oakland. That city is now a terminal point on a par with San Francisco in the shipping of freight. Goods are coosigned direct and delivered to Sixteenth street in car-load lots or by special arrangement heavy freight is landed at Market street by the broad gauge and the narrow gauge freight is delivered at Fourteenth and Webster streets. To and from San Francisco freight is principally transferred by the creek boat from the Broadway and city wharves and by the narrow gauge ferry. The business at Sixteenth street has necessitated an enlargement of the freight depot within a few years and an increase in the clerical force. There is a considerable amount of car-load freight consigned to Oakland merchants, also frequent shipments from the city in quantity. The facilities for the local transfer of freight are first-class and capable of still further improvement as demanded. The railroad tracks skirt the city on the west hay shore, along both sides of the estuary on the south and with the narrow guage to the heart of the city and the Livermore branch by East Oakland with the Y to Alameda from Fruitvale it is possible to put freight down at almost any part from Berkeley to Fruitvale. The tracks out upon the old Long wharf bring the freight train alongside ot the ocean-going ship, and it is only a matter of time when other piers will project into the hay from the west front of the city. The wharves along the estuary accommodate the hay and coasting commerce, and the Government improvement will eventually give a depth of water sufficient to accommodate clipper ships and other ocean carriers.

Personal.

JAMES L. FLOOD, the Comstock mining magnate, has gone to New York for a brief visit.

W. H. WELDIN has resigned as superintendent of King Solomon's Mines, Grass Valley, and Charles Brookington has been elected to fill the position.

WM. P. HODSON of Shasta county, who has been some weeks in San Francisco arranging about the mineral exhibit to Chicago, has returned to his home at Redding.

CHAS. M. CLARK, World's Fair commissioner for Yavapai county, Arizona, is urgent in his appeal to the miners of that locality to make a creditable exhibit of ores and minerals.

DOUGLAS L. V. BROWNE resigned as general manager of the Rico-Aspen Consolidated Company of Rico, Col., but has been appointed consulting engineer of the company with headquarters in Denver.

WM. A. HANLEY takes the place of superintendent of the Brunswick mine, Grass Valley, vice Manager Fitzgerald, resigned. The Brunswick belongs to a New York company. Mr. Hanley is an accomplished millman.

JACOB Z. DAVIS, trustee of the State Mining Bureau, returned on Tuesday evening from a two months' eastern trip. During his absence Mr. Davis secured a number of exhibits for the bureau which will he placed on display within a few days.

ALF TREGIDGO is stirring up the Nevada county miners to make an exhibit at the World's Fair. He guarantees that each and every exhibit will be properly cared for, and at the close of the Fair returned to its owner or owners. Transportation for the ores will be furnished gratis, and there will be no cost whatever to the contrihutor.

National Forestry.

LAMANDA PARK, LOS ANGELES CO.

TO THE EDITOR:—National forestry is based upon two grounds—first, the advantage of maintaining forest production by the cootrol of forests by an undying corporation like the State. Uoder this head come the prevention of waste, the prevention of fire, the regulation of ripe timber-cutting and provision for the reproduction of the most useful forest growths. A forest management with this object alone would also have to arrange for the exploitation of all the resources of forest lands, other than forest products themselves. These interests would comprise water developments, reservoirs, mines, quarries, game, fish, travelers for health or pleasure, and, in places, pasture.

The object of regulating these last uses of forest lands would not be to curtail or vex them, but to prevent useless waste and destruction of the forests by carelessness and fire.

The reason that national forest management is advantageous to secure a continued supply of lumber and other forest products, is that private or even State management cannot give a uniform system or a uniform protection, nor consider the forests from any better point than a narrow and purely individual or local one.

Thus, in individual or State ownership, a good system adjoining ao indifferent or a bad one would be constantly subjected to the dangers ot trespass, depredatlon and fire growing out ol the bad one. So, also, a system in regard to some particular forest product, like tar, might be good policy, give returns and maintain product, if uniform and general, while it might, and probably would, be both costly and useless if individual or local.

Besides this, a national system would necessarily consider the forest from a wide and general view as to locality, product and time.

As to locality, a national system would consider, for instance, the interests of Dakota, Nebraska, Missouri and all the States upon the water system heading in Dakota. An individual system would not consider such interests at all. A Dakota system would only consider Dakota and pay no heed to the other States.

As to product, an individual system could only consider individual interest; a State system could only consider State interest. In neither case could national and general interests be provided for.

As to time: The most important forest product, lumber, requires a very long period of time to come to its highest economic value. One, two and often three or more generations must be born and die before a forest comes to maturity. This fact makes it plain that no individual system can ever adequately provide for the reproduction of forests. To secure the reprodnction of the most valuable timber requires scientific management covering many years of intelligent and watchful care.

That this care pays handsomely we know from the returns of national forest management in Europe, but individual interests, especially in this country, even if capable of a uniform and broad policy, can never be expected to expend care and money for rewards to be enjoyed only by generations yet unborn.

While the first ground for a national forest management is important, the second is essential.

The second ground for a national forest system is based on the demonstrated necessity for the maintenance of a certain forest area to secure the highest agricultural product from any given territory, and, second, on the demonstrated necessity for a certain forest covering on watersheds. The first base is due to the influence of forests on winds, frosts, climatic extremes, and on their probable effect on the character and distribution, if not on the quantity, of the rainfall. The second base is due to the influence of forests on the delivery of rainfall into springs and streams. As any watershed is forested, so is the delivery of its rainfall affected. If it be adequately forested, the rainfall will be detained and seep into the ground to appear in the springs and streams in a perennial and even delivery. If it be denuded and bare, the delivery of the rainfall will be short in time and floodlike in character. The watercourses in such districts always are of torrential character. The rainfall tends to become diluvial in character and its delivery is so in fact. The water delivery is alternately dangerous in its excess, in its detritus-carrying and detritus-dnmping, and in its erosive power, while the sudden flood flow of the rains precludes the possibility of a perennial supply. The water is gone and the stream bed is now a raging torrent, and now a dry and arid waste. Irrigation, domestic water and the value of streams for navigation are all diminished or destroyed by an undue denudation of the watersheds.

Iteratioo has worn through the shell of prejudice and indifference, and, reenforced by actual recent and recurring experience, has made California a community demanding immediate forest protectioo for its watersheds.

We favor the Paddock forest bill. At the same time we would have preferred our own bill introduced long years ago, which provided for the withdrawal of all Government lands in forest and for a system of management of the same. The Paddock bill is probably a more practicable measure. It provides for the management and care of forest reservations made and to be made. It consequently looks to a policy of initiative and growth and avoids the difficulty of creating suddenly a large forest force and changing all at once the entire neglect of, and freedom for depredation and waste in, the Government forest laods. On the other hand, every day that passes reduces the Government forest holdings and increases the waste due to carelessness and fire. The situation reminds one of the Roman legend of the Sibylline books.

Whatever defects the Paddock bill may have, it is good—doubtless the best we can now expect—and should be heartily supported. ABBOT KINNEY.

The Grain in Fireclay.

Clay, notably fireclay, in every respect resembles very closely the fundamental and natural principles of oxides and ores of metals, and maintains the same characteristics with remarkable relations all the way through its formation after manufacture. But the closest of all metals of which it assumes similarity is iron.

For example, says the *American Gas Light Journal*, iroo ore ground and smelted and cast loto pig metal is short or brittle, not having any particular grain, except slightly lengthwise the way the metal flows in casting. If this same pig metal is reheated into a workable or pliable condition, and put under rollers and for a number of times rolled in the same direction, then by the compression the crystals, which, in dimensions almost equal in every direction, and joining only at geometrical points, are first flattened and theo drawn or pressed oblong. The process of cooling again acts upon them to slightly separate the crystals, but leaving them in groups closely adhered to each other, and wherever these breaks or contraction cavities occur there will take place a sliding of the particles upon each other in the process of rolling.

The effect of this is that the construction of the original pig metal, which appears very much like compressed salt, becomes a series of fibrous formed material, overlapping each other like brick masonry, excepting that the longitudinal sections are probably hundreds of thousands of times smaller in diameter.

In many instances the formation of rolled iron may be compared with oak timber in its formation of grains or fibers which has at the same time throughout its longitudinal structure a large amount of cross fibers.

Comparing the same with the continuous workiog of the clay into one direction produces the same effect of forming a fibrous grain, as can be seen in a bar of rolled iron. For instance, take a sewer pipe when it first comes from the press; it would be difficult to tear it sideways, while it can be torn into small shreds lengthwise the course it passed through the die. The same with a brick being made on a spiral or plunger brick machine. If the brick is an end cut, it will be almost impossible to break it evenly crossways, while there would be but little trouble to split it lengthwise into any number of parts. Therefore, in bricks which are expected to carry much transverse strain, the lengthwise grain is much preferable over all others.

In the forming of grain in clay, water plays a very important part. As the wedging of the clay goes forward, the molecules of clay become closer attached to the moving particles, and the water and air find their way into the horizontal layers, forming the lubricator between the stratas.

This is easily witnessed by a simple practical experiment. If a block of plastic clay of about 25 pounds be taken and rolled for several times in one direction, forming the grain in length, then the block set on end, and slabs cut from it about one inch thick, will make tiles about 9 inches by 9 inches by 1 inch in size. If these are put to dry, the probability is that about 90 out of 100 will crack through the middle, the same as if a slab be cut off the end of a log crosswise, which would be sure to go to pieces before it became dry.

On the other hand, if the clay slabs or tiles were cut from the side of the former mentioned blocks, the effect of rapid drying would simply be warping, the same as a green board would turn up if placed in the sun.

To produce the best effects or results we must comply with certain natural laws, suitable to the material we want to manipulate. Many clay workers worry themselves, and do not understand why their bricks or materials crack all to pieces. We would say, study the geological and chemical formation of the raw material first, then the technical working, and the result will be satisfactory.

EX-SUPERINTENDENT RUTHERFORD of the Berkeley system of street railroads states that the Southern Pacific Company is making arrangements to build a cross-town electric road. According to Mr. Rutherford the plan is to build an electric road from Twenty-third avenue along Twelfth street to East Oakland. The company would then move the Sixteenth street station to the terminus of its own electric road, and thus shut out the two electric roads which now have their termini there. Then the company intends to extend its local steam system to Fitchburg, where it has been buying property lately. A local service will be kept up from that point to compete with the Haywards electric road; which has been cutting into the travel of the Southern Pacific recently. The loop system proposed at Fitchburg will probably not be carried out. The trains will be run there on straight tracks. The Southern Pacific owns the horse-car line from Twelfth street and Broadway along Twelfth street to Thirteenth avenue in East Oakland. The line is a short one and is paralleled on both sides by electric roads. The horse-car line is therefore practically useless, and at the present time hardly enoogh money is taken in to pay for the feed and keeping of the horses. The franchise, however, is a good one. If an electric road is to be built, as stated by Mr. Rutherford, the corporation will have to secure a franchise from Thirteenth avenue to Twenty-third avenue, and from Broadway to West Oakland. The company would then be in direct competitlon with the Haywards line for the local patronage. Others now hold a franchise for a street railway from Broadway along Twelfth street to West Oakland, but no steps have yet been taken to build the road. This new electric road relieves, to a considerable extent, the pressure of travel on the Seventh-street system. It is intended, so it is stated, to sell commutation tickets on the Twelfth-street road that will take the passenger to San Francisco by way of the Sixteenth-street station.

THE modern passenger locomotive for high-speed trains is capable of developing at least 1200 horsepower, and costs abcut $10,000.

The Study of Living Protoplasm.

In biology the study of life in its simplest manifestations continues to attract the attention of many investigators, and important progress is being made. Dr. W. Flemming of Kiel has a short paper in the *Anatomischer Anzeiger*, In which he combats the idea upheld by some authors, that the well-known network observed in the nucleus of certain cells is a false appearance due to accidental and secondary changes in the material during preparation. Dr. E. G. Balbiani has studied the nucleus from another point of view, namely, in reference to its influence on the growth and reproduction of the cell. Dr. E. B. Wilson has been experimenting on the developing egg of *Amphioxus*, tearing asunder the segments at various stages in the subdivision, and trying the effect of allowing these parts tn continue their development separately.

Dr. Balbiani's investigatlons were conducted by cutting up the protozoan *Stentor cœruleus*, and observing the process of regeneration in the various pieces. He finds that wounds are soon obliterated, and that each fragment becomes a new *Stentor* whether or not a trace of the nucleus happens to be preserved. The merest trace of a nucleus accelerates repair, but, at the same time, the effect of its total abseoce is not appreciable until this repair is tolerably advanced. Even when present, indeed, the reconstitution of the nucleus is the last act in the process of regeneration. For the complete restoratioo of all the parts, hnwever, Dr. Balbiani finds that the constant presence of a nucleus is essential, and he has often observed the death of incomplete specimens, marked by the spongy character of the protoplasm with water forming numerous small vacuoles. He has also sometimes noticed a curious tendency, during regeneration, to a multiplication of the organism by division, and he believes that the nucleoli are exclusively concerned io sexual reproduction.

Dr. Wilson's results are very curious. If an egg of *Amphioxus* that has just segmented into four parts be taken and subdivided into its components, each will usually continue to develop, and will eventually give rise to an oval, free-swimming larva one-fourth the normal size, but otherwise quite ordinary in appearance. If this four-celled stage be allowed to fall into two pieces, each half not infrequently develops successfully and gives rise to an embryo of half the normal size. Experiments, however, seem to show that if the egg be split into pieces at its eight-celled stage, none of these segments do more than acquire cilia, and swim about actively in their simple state; while, sooner or later, all of them die. The same phenomenon has been observed by Dr. Driesch in Echinoderms.—Natural Science.

STEEL PAVING IN CHICAGO.—An ordinance for paving Dearborn street, Chicago, between Monroe and Madison streets, has recently been passed, that provides for the laying of wooden blocks on a steel base. Above a thick stratum of sand there are laid solid steel plates. They reach from curb to street-car track and are a half-inch thick, perhaps thicker. Rising from this solid plate to the height of two inches are steel tongues an inch thick, securely bolted to an underlying plate, and running from curb to street-car tracks. Grooves are sawed in the bottoms of the blocks, and they are fitted snugly on over those tongues. Every block is thus securely fastened in place. As they are oblong blocks with sharp corners and fit closely together, being held by these tongues firmly at the bottom and supporting each other, being fitted in closely, it looks as if it would form a durable pavement. The blocks are of wood, eight inches long by four wide and six deep. It would form perfectly level paving, and wonld be noiseless. The inventors of this new style of pavement have great confidence in it, and have offered to put it down for experimental use, and only in the event of a two-years test proving satisfactory are they to be paid.

THE Leach flume, Butte county, was badly damaged by the recent storm, and the citizens of Honcut, to prevent the busioess going from there, intend to rebuild. The flume runs from Wilsons Creek to the mill at Honcut. The cost of labor on that portinn of the flume was estimated at $2000, and a guarantee for $1200 worth of labor has already been given. This flume has been a great benefit to the residents of Honcut, as it gives employment to about fifty men, supplies many with water, and enhances the value of property. The flume is owned by the Leach Lumber company, and is being run in the interest of the Honcut Lumber company. The engineer's estimate of the cost of repairing the damage to the entire flume has been $7500. The labor to be performed by the citizens will amount to $2000, and the company will complete the balance of the work. They will have to put in about 368 boxes, but will be able to use some of the old timber to advantage. The lumber company does not feel justified in standing the full burden of the expeose attached to the repairing of the flume, and for that reason the residents of Honcut have determined to repair the flume at the lower end.

AT Butte, Montana, on the day before Christmas, the Anaconda Mining Company laid off 600 meo, the entire force that had been working in the Anaconda and St. Lawrence mines. All work was suspended in the Chambers syndicate mines three weeks ago so that this action practically shuts down every mine operated by the Anaconda company. No more ore will be shipped to the smelters for about thirty days. The smelters will continue to run on the ore reserve in the bins. Manager Daly gave it out that the suspension was for the purpose of retimbering the shafts, and that the copper market or copper combine had nothing to do with it.

A MONOLITH weighing 600 tons has been detached from its bed in the quarry at Houghton, Mich. Fifty workmen drove their wooden wedges simultaneously until a crevice appeared in the base of the stone.

Squares and Square Roots.

TO THE EDITOR:—This method may or may not be new; it is not commonly known, and the principle has its merits, especially in certain cases. The fundamental equatinn is, $a^2 - b^2 = (a+b)(a-b)$; that is, the sum of two numbers, multiplied by their difference, equals the differeuce of the squares of the numbers.

Let us find the square root of.....11, 90, 25

30	900	
Sum × dif.	256	to add.
340	115600	
Sum × dif.	3425	to add.
345^2 =	119025	

What is the square root of.... 20

40	1600	
Sum × dif.	336	
440	193600	
Sum × dif.	6209	
4470	19980900	
Sum × dif.	35776	
4474	20016676	
Sum × dif.	8947	subtract.
4473	20007729	
Sum × dif.	8945	subtract.
4472	19998784	

We see that 4.474 is too large, and 4.473 is also too high, while 4.472 is a little too low, but near enough for most purposes, and a closer approximation could be got by carrying the work to another decimal place.

The method admits of working either up to a higher number or down to a lower one for the root, as shown in the last example, and it will be seen that, when the roots change by 1, the difference of the squares changes by 2; hence, in working by changes of 1 in the root, having done that once, we need not take the trouble to add the roots together in order to find the amount to add to, or subtract from the last found square, but simply to copy the last previous difference, plus or minus 2, as the case may be. In like manner, if the numbers (ronts) differ by 10, the difference of the squares increases or decreases by 200, and so on; this has its use as follows:

For any series of numbers increasing in arithmetical progression, the difference of the squares increases by the amount of twice the square of the increase of the number: $(a+2x)^2 - (a+x)^2 = (a+x)^2 - a^2 + 2x^2$.

Find the squares of 274 and of each of the three numbers next above and below it.

$274 \times 274 =$	75076	
		dif. 547.
273^2 $274^2 - (274+273) =$	74529	
		dif. 545.
$272^2 = 273^2 - (547-2)$	73974	
		dif. 543.
$271^2 =$	73431	

$274^2 = 75076$

dif. $= 549 = 274^2 - 273^2 + 2$.

$275^2 = 75625$

dif. 551.

$276^2 = 76167$

dif. 553.

$277^2 = 76729$

Conversely, if we have a series of numbers of which the differences uniformly increase or decrease by 2, 200 or 20,000, we need only to extract one root and we obtain the others by adding or subtracting 1, 10 or 100, as the case may be.

Another fact which is of some slight use is, that the right-hand figure of a perfect square always corresponds to one of two figures at the right hand of the root, except 5, which is at the right of both, thus:

Number ends with	Square ends with
1 or 9	1
2 or 8	4
3 or 7	9
4 or 6	6
5	5

In the first example, having found 3 and 4 as root figures, we know that the last figure must be 5, if the number is a perfect square; hence we try 5, and, if it does not fit, we know that the number is a surd, and we must work to decimals, if closer approximation to the root is desired.

To extract the square root of a number:

RULE.—Mark the number off in periods, as usual. Select a number in one, two or more figures, as a trial root. The number may be too large or too small; square it and set the square down toward the right. If it is less than the given square, set a larger trial root under the first, add the two together and multiply their sum by their difference; add the product to the square of the first trial root. The sum is the square of the second trial root.

If the figure added to the trial root is in the next term, affix one cipher to the root and two ciphers to its square, as shown in the first example given.

If the square of the trial root is too great, set a smaller trial root under the first, add and multiply as before, but subtract the result from the first square, as seen in the second example, where both of these resources are applied. C. H. A.

Progress of Fuel Oil.

The character of the petroleum found in California makes it specially useful as a fuel oil, and only in a few instances have "green" or lubricating oils been found. In the southern portion of the State, where most of the oil is produced, it is largely used as fuel. As coal is expensive here, California producing very little, the oil is destined to come into even more general use for fuel than at present. It is interesting to note the increasing use of oil as fuel in Pennsylvania, the greatest producer of both coal and oil of any State in the Union. The *American Manufacturer*, of Pittsburg, says: "Industry after industry, plant after plant, is introducing oil as fuel, and this is not restricted to localities where coal is expensive and oil is cheap, but the Pittsburg district, where coal is so plentiful and oil has to be piped some distance is in nowise behind in the adoption of fuel oil. An interview with Mr. William T. Eyer, of New York City, representing the fuel-oil branch of the Standard Oil Company's business, shows the increasing popularity of the new field. Mr. Ayer said that it must be understood by manufacturers that oil must be used properly in order that it may be used economically. By properly is meant with the appliances that have been invented for its use after great study, and which ample experience has proven to be successful. Oil can be used in such a way as to occasion an extravagant waste, and then again, with the proper appliances, may be used in such a way as to get the maximum heat from the minimum supply of fuel. This is the fundamental necessity. Without any fuel-saving appliances and devices, and there are a great number of them of more or less efficiency, oil will of course be wasted and its use as fuel be made less economical.

Oil is being used at present, and has been used for several years, in a large number of the largest manufacturing institutions in the United States, embracing almost every branch of industry. The Chambers & McKee Glass Company, at Jeannette, Pa., using a 900-ton furnace, has used oil successfully, and prefer it to any other fuel in flattening. The company claims that the heat is better adapted to securing a superior product. The United States Glass Company's factory at Greensburg, and one of the same company's factories at Pittsburg, are using oil successfully, and it is very probable that it will use oil in its two factories at Findlay, O., the Columbia and the Bellaire goblet works.

New Jersey factories also are using oil. Whitall, Tatum & Co., at Millville, the largest bottle works in the world, are using oil in many of their departments, and they are making some extensive additions based upon the success of oil as a fuel. Oil costs them $1.15 per barrel. The Cohansey Glass Company, of Bridgeport, N. J., the Whitney Glass Company, at Glassboro, and the Woodbury Glass Company, at Woodbury, all use oil exclusively.

The Moore Bros., at Clayton, have put it in their melting furnaces and all through their works. The Riverside Glass Company, at Wellsburg, W. Va., is meeting with the best of results from the use of oil, after testing it for two years. The Illinois Steel Company, although owning and operating its own coal lands, uses 5000 barrels per day for 300 fires. In Pittsburg, oil is selling at 70 cents per barrel, and in New Jersey at about $1.15 per barrel. Oil in Findlay is selling at 50 cents, and is therefore cheaper than at any other place in the world, excepting in the immediate producing district. In the Northwest, one of the large factories using oil is the Cream City Glass Company.

The Libby factory at the World's Fair will use oil as well as the entire power plant in the grounds. The advantages claimed for oil as a fuel are, regularity in the heat, a perfect control of the fire at all times, absence of expense in handling, and economy in all features of fuel consumption. In the iron furnaces, it is claimed that the heat is less harsh and more mellow, which insures a better product. The Chicago Hydraulic Press Brick Works use it in preference to gas. Getting at a ratio between coal and oil is a difficult matter. The quality of coal differs in every section, and of course varies accordingly in the heat-producing power. As near as it can be figured, however, under boilers a ton of coal is equal to three barrels of oil, and under furnaces to less than two barrels. But with the use of oil, the output of a plant can be very materially increased without any additional outlay for boilers, etc. This largely decreases the ratio.

MECHANICS FAIR.—There is much activity being displayed by the management of the Mechanics' Fair and "dress parade" of World's Fair exhibits to be held next month at the Pavilion. Among the new exhibits which space has been asked for, is a complete mining plant on a small scale, showing the process of extracting precious metals from ore. An automatic ore-carrier and elevator, the invention of a young Californian, will be a feature of the machinery exhibit. The exhibits which are made at the Pavilion will be examined by the World's Fair State Commission, and those which are decided to be worthy will be sent to Chicago at the expense of the State. Intending exhibitors should bear in mind that the test of merit rests in the hands of the State Commission. The directors of the Institute have decided to place season tickets for the fair on sale only at the library rooms on Post street. Tickets may be secured by the public at the rates which have generally prevailed: $5 for double season tickets, $3 for single and $1.50 for children. Each purchaser of a double ticket, however, will be entitled to a three months' membership in the library, with all its privileges.

GOLD IN GERMANY.—Gold is obtained as a by-product at ten German smelting-works. Of pure gold there were produced: In 1886, 1065 kilos., worth 2,974.000 marks; 1887, 2257 kilos, worth 6,281,000 marks; 1888, 1793 kilos., worth 5,004,000 marks; 1889, 1958 kilos., worth 5,465,000 marks; 1890, 1855 kilos., worth 5,162,000 marks. A mine worked exclusively for gold does not exist in Germany.

Society of Naval Architects and Marine Engineers.

Some of the most prominent and influential men in the ship-building and shipping interests of the United States, says the *American Machinist*, have completed the preliminary organization of a professional society of high standing, to be called the "Society of Naval Architects and Marine Engineers," whose object will be the promotion of ship-building, commercial and naval; and in furtherance of this object, annual meetings will be held for the reading and discussion of appropriate papers and interchange of professional ideas, thus making it possible to combine the results of experience and research on the part of shipbuilders, marine engineers, naval officers, yachtsmen and those skilled in producing material from which ships are built and equipped.

A society of this character cannot fail to have a great influence on the advancement of ship-building in all its branches. Indeed, it is reasonable to form such a conclusion when we consider the great amount of good that has been done by similar societies existing in England, Scotland, France and other European countries. These foreign societies include among their officers and members the foremost shipbuilders, engineers, shipowners, naval officers, members of Parliament and other public men interested in shipping. Many laws promoting the greater security of life at sea, and general improvement in ocean carriers, were originated by these societies, and the present advanced state in naval architecture and marine engineering is directly traceable to their proceedings and investigations.

In this country, the influence of kindred societies, such as the American Society of Mechanical Engineers, Society of Civil Engineers, etc., has done much toward the advancement of knowledge and the successful solution of many knotty problems which have presented themselves in every-day practice in these particular branches.

Considering our vast seacoast and magnificent harbors, and the abundance of material from which ships are built, in connection with the increasing importance of our shipbuilding interests and the development of the navy, the organization of this society at this time must be regarded as opportune, and as one that will have a valuable and extended field of influence in technical subjects and public affairs, and it will undoubtedly stimulate actual growth by rousing popular as well as professional interest in a branch of industry which should be one of the most powerful factors in the development as a nation.

We append a list of gentlemen who have accepted offices in the preliminary organization, and who have expressed themselves in the most cordial terms as to the expediency and ultimate success of the undertaking: President, Clement A. Griscom, of Philadelphia, president International Navigation Co.; first vice-president, Theodore D. Wilson, of Washington, D. C., Chief Constructor United States Navy; vice-presidents, Charles H. Cramp, of Philadelphia, Pa., president Wm. Cramp & Sons' Ship and Engine Building Co.; Commodore W. Melville, of Washington, D. C., Engineer-in-Chief U. S. Navy; George W. Quintard, of New York, president Quintard Iron Works; Irving M. Scott, of San Francisco, vice-president and general manager Union Iron Works; Francis Walker, of Boston, Mass., president Massachusetts Institute of Technology; William H. Webb, of New York, naval architect. The list of members of council also contains names of many prominent men.

It is proposed to have a meeting of the council in January, 1893, at which time all details as to organization, constitution, incorporation, etc., will be definitely arranged, and the exact date of the first general meeting decided upon. It is probable that this meeting will take place in New York at the time of the naval review, in May, 1893.

We wish the society a complete success in its permanent organization and its future usefulness. All who are in sympathy with its objects, and who wish to give it a hearty support and become members, should send at an early date for particulars to W. L. Copps, Esq., secretary Society Naval Architects and Marine Engineers, 1710 F street, N. W., Washington, D. C.

LARGE DEPARTMENT STORES have ways of their own to force manufacturers of novelties into submission. For instance, if a manufacturer of any good-selling commodity refuses to sell to them with a big enough allowance to enable them to beat the regular retailers, they will buy and sell at regular prices all the rival goods in that line, and sell the goods of the stubborn manufacturer at below cost, giving as reason that the others are superior, and create thereby enough of prejudice to injure his goods. The manufacturer has no way of remedying this, and must come to terms, as the selling below cost of his goods spoils their sale at regular prices at the retailers, and the amount of sales lessens and he must yield.

THE ACADEMY OF SCIENCES.—At a meeting of the Academy of Sciences held Monday evening, the nominating committee submitted the names of the following gentlemen as the regular ticket at the forthcoming election of officers: Pres., Dr. H. W. Harkness; First Vice-Pres., H. H. Bauer; Second Vice-Pres., J. G. Cooper; Cor. Sec., T. S. Brandegee; Rec. Sec., J. R Scupham; Treas., L. H. Foote; Librarian, Carlos Troyer; Director of museum, J. G. Davis; Trustees, W. C. Barnett, C. F. Crocker, D. G. Hayes, E. G. Molera, G. C. Perkins, Adolph Sutro, John Dobr.

VITRIFIED brick paving was laid on 11 miles of streets in Philadelphia in 1891. Most of the brick was laid for light traffic. Lack of uniformity in hardness is the main trouble with the brick. The last report of Mr. Geo. A. Bullock, Chief of the Bureau of Highways, Philadelphia, states that brick pavement costs about 20 per cent less than Belgian block or asphalt, and always presents a non-slipping surface. Portland cement has been substituted for pitch in filling joints, as the pitch always ran over the bricks, making them slippery.

Mechanical Progress.

Pumping Plants.

An expensive blunder in the arrangement of pumping plants which appears to be not uncommon was discussed at the recent meeting of the American Society of Mechanical Engineers. It seems to be a common idea that a pump must not have its suction side under any considerable pressure. In a case cited, the water supply for the pumping station of a town waterworks was piped to the pumping station under a head of about 60 feet. Instead of utilizing this head to assist the pumps, the pipe was allowed to empty into a receiving well at the pump station, and pump suction was taken from this well. The engineer, who had the temerity to suggest that the supply main might be connected directly to the suction with a large decrease in the load on the pump, had a hard fight to get his plan carried into effect. Other cases were reported where large sums were expended to make sumps and reservoirs for pumps to draw from, and avoid placing any pressure on the suction side of the pump plunger. The only reason cited for this wasteful method of working is that the suction valves would not seat, were the suction under a head; but this is apparently pure theory. The real reason, probably, why a prejudice exists against pressure on the suction side of the pump is the water-hammer which is apt to accompany it. This is easily obviated by placing an air-chamber on the suction side, and, indeed, this is a benefit to any pump where the suction main is of any considerable length. The necessity of an air-chamber on the force main seems to be comprehended, but the advantages of a similar cushion on the suction main escape the attention of all but a very few. A large proportion of the troubles with water-hammer in pumps could be obviated by a proper arrangement of air-chambers. That placing an air cushion on the suction is far preferable in point of economy to the frequently practiced plan of snifting in air, or even forcing it in by an air compressor, will hardly be denied.—Engineering news.

Compound Locomotives.

The feeling in favor of the compound locomotive seems to be slowly but surely growing. The German Government has recently ordered four engines of this type and of a new design, namely, two four-axled and two five axled machines, the former to have four cylinders, two at the side and two under the boiler. On the other hand, it is to be noted that at the late international congress in St. Petersburg, MM. Parent and Concanargeres, of the State and Paris, Lyons, and Mediterranean railways respectively, said in substance that the advantages claimed for the compound system had not yet been demonstrated to the satisfaction of all engineers. It was true, however, they remarked, that those in favor of compound locomotives were more numerous than those who were opposed to them, and that the number of compound locomotives in use has augmented in less than three years from about 680 to 1858. The two-cylinder compound locomotives, they explained in detail, increased in number from 522 to 1371; the three-cylinder compounds from 99 to 108, and the four-cylinder engines from 59 to 379. These appreciable developments are to be ascribed largely to the higher steam pressures used. The two-cylinder compound locomotive has met with most favor; but, on the whole, the greatest improvements have been made with the four-cylinder engine. The results of some long-continued tests have practically shown that in countries where coal is cheap the changing of ordinary into compound locomotives, or the building, at the outset, of compound engines is not likely to lead to any advantage. But where fuel is dear, the building of new compound, and the rebuilding of old, single locomotives to work on the compound system, and the adoption of higher steam pressures are advisable. With the two-cylinder compounds, at least, the French engineers stated in conclusion, it has been found that there is no increase in cost for oil, maintenance, etc., as compared with ordinary engines.—Iron.

Objections to Firing with Lima Oil.

Some time ago the Engineers' Society of Western Pennsylvania appointed a special committee to consider the "smoke question at Pittsburgh," and their report was recently submitted. From it we take the following: Lima oil is at present used in various kinds of furnaces, being fed into the combustion chambers by means of air under considerable pressure. It makes an easily regulated, smokeless fire, but has not received much application in Pittsburgh owing to its cost being equal to or greater than coal. Its disagreeable odor is also an objectionable feature. Electricity is proposed for heating purposes, but at present it finds little or no application here. Every city has its peculiar needs and activities which must be recognized in attempting to apply to it general results applicable elsewhere. Of no city is this more true than of Pittsburgh, with its varied industries, its natural resources and enormous production. Hitherto smoke has been the black ensign of the ceaseless warfare carried on here with the forces and materials of nature.

It is estimated that before the introduction of natural gas Pittsburgh consumed about 10,000 tons of coal daily and that the present consumption is about 7000 tons. In Pittsburgh and Allegheny about 25,000 houses are still supplied with natural gas, amounting to several hundreds of millions of cubic feet daily, and probably representing more than half the present coal consumption. If, therefore, our skies are darkened now, what may we expect when the present almost smokeless natural gas fires become smoke producers? Our finest resident district, the East End, will especially suffer by the change. Already, owing to the peculiar topography of Pittsburgh, and in spite of the special smoke ordinance recently passed, the East End is often covered by clouds of smoke, mostly produced in the lower parts of the city. Of the 10,000 houses probably occupying the district, it is estimated that four-fifths use natural gas at present.—American Gas Light Journal.

The Nail Tests.

A short time since it was announced that a test of comparative merits of cut nails and wire nails would be made at the Watertown Arsenal, Mass. The first information relative to this test states that last week quite a number of gentlemen connected with the trade saw the test made. The nails used were selected from market stocks, those of the wire being of corresponding size with the cut nails, both in weight and length, and every detail of the contest was conducted by the committee so as to be recognized as authoritative and absolutely fair. Major Reilly, the commandant, selected these nails and assorted them in packages, each one being weighed and recorded. The size of cut nails ranged from 1¼-inch nails, 3d fine, 764, to 6 inch spike nails, 40d and 60d, 6 to 17 to the pound. The wire nails were secured to correspond as nearly as it was possible.

The packages were made up and sealed and were tested in the order of their sizes, beginning with the 6 cut and 6-inch wire. The tests were for the purpose of demonstrating beyond all argument the relative holding-power when used in ordinary building material. A spruce plank, well seasoned and free from knots, was selected and planed perfectly smooth. Into this the nails were driven, first a cut nail, then a wire nail, the depth being precisely four inches each for the six-inch sizes. Before being driven, they were weighed, and showed a difference of only two grammes, the wire weighing 214 grammes, the cut 212.

The first test upon the machine was with a wire nail, and it required 733 pounds to pull it out. Then the nippers were placed over the head of the cut nail, and on the beam of the indicator was registered 836 pounds. The second wire nail registered 673 pounds, and its equal in a cut nail 742. The third wire nail registered 675, and a cut nail of the same size 804.

The fourth nail tested was pulled out with a pressure of 594 pounds, but it required 964 pounds pressure to draw the cut nail, nearly 400 pounds more. The seventh, and by far the strongest holding nail tested, was drawn with 879 pressure, but the cut nail resisted until 1200 pounds was put to bear upon it. This enormous resistance was accounted for by the nails entering a knot on the inside of the plank.—American Manufacturer.

STEAM PIPES.—At a meeting of the Institute of Marine Engineers of Great Britain, Mr. W. J. Nowers Brett read a paper entitled "Steam Pipes—Their Material, Workmanship and Arrangement." Mr. Brett, in the course of his paper, said that the subject of steam pipes had during recent years assumed great importance in the engineering world, and looking at it in the light of some recent experience in explosions and fractures, he thought it well worth their earnest consideration and discussion. The higher pressures of the present development of the marine engine had caused a certain amount of suspicion to rest upon the brazed-worked copper pipe, and accidents, attended in some cases with lamentable loss of life and injury, seemed to confirm engineers in their opinions as to the uncertainty of the ability of these pipes to stand the more severe test now imposed upon them. In the old-fashioned two-cylinder compound engines the brazed copper pipe did its work very well, and there was no reason why it should not be used for very high pressures with perfect safety. Although brazed main steam pipes were looked upon with distrust, the seam of a good copper pipe properly made was as strong as the rest of the material, and for many reasons these pipes were almost exclusively used in marine practice. An important point in favor of copper as a material for steam pipes was that it could, from its nature, take up the greatest number of small, unknown strains that must occur in ranges of pipes, better than any other material, and thereby give less trouble with the joints.

Scientific Progress.

The Physiology of the Iris.

Some years ago, we are told by the *Lancet*, Dr. Brown-Sequard startled physiologists by stating that the iris responded to the direct action of light, and demonstrated the fact by dividing the eyes of eels and frogs into a posterior and anterior half, and directing a ray of light upon the iris. The contraction of the sphincter pupillæ under these circumstances showed that, at all events, the act was not of a reflex nature through the retina, but it was possible that glanglionic cells might be disturbed in the tissue of the iris, which might be sensitive to light and liberate motor impulses in obedience to that stimulus. Steinach has recently investigated the subject, and by a series of careful observations has arrived at the conclusion that the contraction, of the iris when detached from the retina is due to the direct action of light upon its structure. In frogs kept for some time in a dark cool room, and especially in the brown grass frog (*rana temporaria*), and also in other amphibia and in many fishes, the phenomena may be easily demonstrated even in the isolated isis. He found that no effect was produced by illuminating the peripheral zone of the iris (ciliary region); but it was necessary that the light should fall on the pupillary margin, of which, if only a segment be acted upon, contraction occurs. The contraction still happened when the nervous apparatus of the iris was excluded by the action of atropine. Steinach demonstrates that the contraction is not due to the influence of the chromatophores and entertains no doubt that it is really the muscular fibers of the sphincter that are acted on directly. He has made numerous examinations of these, and finds that in amphibia and fishes they are strongly pigmented. In eyes that have been exposed to the light they are short, thick, and not very well defined, while in animals that have been kept in the dark they are slender and sharply contoured. He regards the presence of pigment in these muscular fibers as the determining cause of their sensibility to light. The several rays of the spectrum are not all of equal power in causing contraction in the isolated iris. In a comment on this paper, Langendorff remarks that other muscle cells besides those of the sphincter pupillæ possess pigment granules in their interior—as, for example, those of the tensor choroideæ in mammala.

IRON-ORE SEPARATION.—Mr. Henry H. Eames, of Baltimore county, Maryland, has patented a process for the extraction of iron from gangues, ores, or sponges in which they exist. The apparatus for the purposes consists of an endless belt or band, which has along its surface a series of conducting strips, and, by means of a series of rollers above and below the band, it is made to assume an undulating, corrugated or serpentine form. This band is placed in an inclined position, so that the ores dropped upon it travel naturally upon an inclined corrugated plane. Means are also provided for imparting to the strips upon the band or passing through it an electric current. Upon this corrugated band the ores or gangues are dropped. The current passing through the conducting strips crossing the same causes the particles of iron on the band to attach themselves to the conducting strips. At the same time a stream of water is directed upon the band, which, being inclined, flows in the direction opposite to that in which the band is traveling, washing back the gold or copper or other metal composing the gangue or sponge, which do not adhere to the metal strips, which continue to flow back until washed off the lower end of the band into a receptacle placed there to catch them. The iron particles continue to adhere to the strips, and travel with them to the other end of the apparatus, when the circuit passing through the strips is broken, and the iron particles fall off upon the ground or into a receptacle at that end.

Oils as Lubricants.

Oil as a lubricant may be considered as being one of three kinds, irrespective of its origin. It may be, says the *Manufacturers' Record*, a solution which will harden into a varnish, like linseed oil; it may be a solution like a paraffine oil, which becomes a wax, or it may he oil continually and under all conditions like the fat oil of lard which hardens into a grease. The varnish oils are not good lubricants under any prolonged test, because they dry at all temperatures and leave the friction surfaces coated with an elastic integument.

Many animal oils are largely charged with a natural gelatine, so that they become hard when dry after a long exposure on a metallic surface, which is little better than varnish. Lard oils have this quality when they are carefully made in so low a temperature that this gum will largely remain back with the solid stearine. The wax olls are inferior to the fat oils, except it may be asserted that they are best where the temperature or the pressure is very great, and even then a long experience indicates that when their tough cohesion is overcome by heat, pressure or dilution, and thus becomes an inconsiderable factor, their value as separating media is probably inferior to the fats.

While the fat oils are eminently safe as separators of surfaces, they are eminently viscid, and develop an immense amount of resistance between their molecules, atoms, drops, or whatever kind of particles it may be that slip by each other when matter is in the fluid state. This viscidity is increased by pressure, cold and evaporation. It is obvious that all the resistance there may be noticed in any machine where the surfaces of the bearings are separated by lubricants which adhere to such surfaces with greater persistency than they cohere together internally is that due to the viscidity of the lubricant.

Sanitary Measures for New York Street Cars.

A report will be presented at the next meeting of the New York Board of Health, advising the discontinuance of textile fabrics as mats in surface and elevated cars. The medical department of the Board of Health has come to the conclusion that the danger of propagating disease in this way is by no means imaginary. By microscopic examination of the dust coming from these mats, it has been found that numberless disease germs are everywhere prevalent in them, and are transported by means of the clothing and dust from the shoes to the living rooms of passengers. In this way every patron is forced to risk his health because of the horrible habit of some person spitting on car mats.

Dr. Bryant of the health board proposes for the present to substitute wooden slats, frequently washed, in place of textile mats, as less likely to carry and retain the infection of tuberculosis, small-pox, diphtheria, scarlet fever, typhus fever and other diseases. It has been shown by Dr. Koch that the sputa of persons suffering from pulmonary tuberculosis was filled with minute organisms, capable, under favorable circumstances, of propagating the disease in persons previously in sound health. Examination of the dust in sitting rooms, has also shown that the microbes of consumption are apt to lodge in places not frequently dusted, such as backs of pictures hanging from the walls. It has been found that the ordinary mode of transference is through the dust brought in on the shoes and clothes of visitors or occupants.—St. R. R. Gazette.

MOST persons would say that the diameter of the largest steamer funnel is four to six feet, and would want to wager that it is not more than eight feet. How far from the actual size such guesses are, may be understood when it is stated that the funnel of the Cunard Liner Etruria measures a little over 18 feet in diameter. At even a short distance away, this can hardly be believed. It gives an idea of the enormous size of the big steamers.

CALCULATIONS based on the observation of the refraction of light have caused it to be supposed that the air becomes so rare at the height of about 60 miles that the distance may be regarded as the limit to its sensible extent, but other calculations, made during the present century, of the distance from the earth at which meteors ignite, indicate that the atmosphere extends to upward of a hundred miles.

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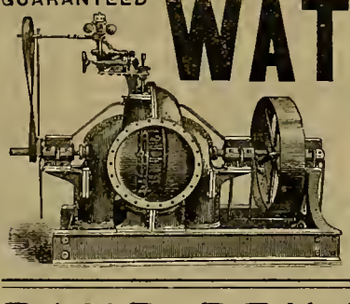

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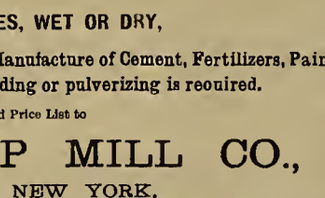

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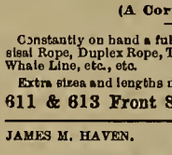

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Earthquakes and Building Constructions.

The late seismic disturbance in Japan has caused the Government of that country to appoint a commission to inquire into the best method of constructing buildings so as to render them the least liable to the effects of such convulsions of nature. As was to be expected, that commission has found it to be exceedingly difficult to formulate any hard and fast rule applicable to all cases. It had been anticipated that the commissioners would long ago have submitted their report, and that rules founded upon it would have been in force many months back. But, according to the latest intelligence received, no such report has yet been sent in. Every possible alternative measure had, no doubt, received full discussion, but to each and all of these there seems to have been some serious objection to be taken. The subject has already received wide outside discussion in the public press of Japan, but this does not appear to have aided the specialists deputed to consider it in arriving at any determination. It is well known, observes the *Engineer*, that in all countries liable to such visitations it has hitherto been held to be the chief desideratum to confine the erection of buildings to a single story only. By following this method the advantage is certainly secured of minimizing the disastrous results to an earthquake. But although this is the case, the method gives no assurance against either the destruction of property or loss of life, and it is mainly in the character to be given to the foundations of a building that must be sought the fullest possible immunity against such casualties. As our readers are doubtless aware, most of the dwelling houses in Japan—the country, perhaps, of all others most liable to these visitations—are merely wooden frameworks covered with a material analogous in character with what is known as papier maché. Yet even these light and relatively elastic structures give way by thousands when rudely shaken by the earth waves, and their inhabitants suffer from the dislodged timbers almost as much, if not more than would be the case if the walling of their dwellings had been of solid masonry. The fact would seem to point to the conclusion that the base of such erections must be practically continuous and rigid; that no single part of a building could be affected save in similar relation throughout the structure. Of course, if the base or foundation be of masonry, this, however well bonded, can afford no such guarantee. Theory would, therefore, point to the adoption of the principle of a trussed girder as a sort of base frame on which the walling might be constructed. If this were of metal, laid direct upon the ground, sufficient rigidity could be obtained throughout to insure that the failure of any portion of the earth below it would have no immediate local effect. Until the report of the commission referred to has been made public, it will be impossible to know if any suggestion of the nature we have made now or in the past has been under its consideration, but, although we admit that this might not be applicable to buildings of larger size or massive construction, it would seem to be well suited for insuring a large degree of safety to the majority of native houses, built, as these are, of the light materials we have named. The subject is undoubtedly one possessed of great interest, as also one calculated to exercise alike the utmost ingenuity of engineers and architects.

Pittsburg's Natural Gas Supply.

The cold snap of last week says the *American Manufacturer* demonstrated the fact that Pittsburg's natural gas supply is fully as good if not better than it was last winter. The different gas companies during the past summer have been doing a vast amount of developing, and many managers were found yesterday smiling in self-satisfaction. They report that the number of new consumers who have been added to their lists during the past fall has been fully twice as large as on any previous year since the introduction of the fuel into Pittsburg homes. There are at present not less than 25,000 families in Pittsburg and Allegheny who are using natural gas as a fuel. The cutting off of the many large mills by the different companies during the past year has also increased the supply for the use of the private consumers.

Much of the gas is piped from a long distance, the Beilvernon field, for example, requiring 25 miles of a 36 inch main. The Murraysville and Grapeville fields also require long transportation. There are about 400 wells in the different gas fields, all of which empty their product into the fires of Pittsburg, and there are at least 30 wells now under way which will be turned into the large mains before Christmas time. The Philadelphia Company has at the present writing 220 active gas wells in full blast, and has 15 more almost ready to turn into the main. The various companies are now drawing a good part of their gas from the West Elizabeth field, which seems to grow better as it is developed toward the south. The new Pinhook field has also contributed largely toward increasing the gas supply of Pittsburg for the coming winter, for though it is but six months old there are already about 20 producing wells in the new field. The latest discovery is reported from the new field at Newlinsburg, which is on a direct line between the Grapevllle and Murraysville field. The first gas was struck at that point less than two weeks ago by Duff Bros., who brought in a roaring gasser, situated several miles from the extreme limits of either of the other fields, and so far out as to render the chances of a great extension to the eastward very good. Within the past week half-a-dozen wells have been started in the vicinity of the Duff find, and the Philadelphia Company has already secured 2000 acres of territory and will begin to develop at once.

Spool Making in Maine.

Oxford county, Me., turns out nearly all of the spools on which the thread of this country is wound. The spools, says an exchange, are made from white birch timber, and they are produced by the million in Oxford county. There are many other points in Western Maine, also, where the industry is important. There are many sawmills in that part of the State which are kept busy the year round sawing white birch logs into strips four feet long and from one to two inches wide and of the same thickness. These strips are sent to the spool factories, where they are quickly worked into spools by most ingenious labor-saving machinery. The strips of white birch are fed into one machine, and they are not touched—in fact they are hardly seen again—until the spools, all finished for market, except polishing, drop out by the bushel from another machine several rods away from where the strip started in. The spools get their gloss by being rapidly revolved in barrels by machinery, the polish resulting from the contact of the spools in the barrel.

In the backwoods villages of Oxford county one sees scarcely any other industry but spool-making, and every one is in some way interested in the business. The factories have been eating into the Maine birch forests for years, but there seems to be enough left yet to feed them well for years to come. Hundreds of thousands of feet of logs are sawed into spool timber annually.

Shoe-peg factories are also an important branch of business once peculiar to Maine, although it has of late been followed to some extent in other Eastern States, and is spreading to the hard-wood forests of northern Pennsylvania. Maple is used largely in the manufacture of shoe-pegs, although white birch is used in some factories. Shoe-pegs are sold by the bushel, and are worth from three shillings to $1 a bushel, according to quality. More than $150,000 was received by Maine shoe-peg factories last year for goods.

A curious and profitable business has grown up in the Maine woods about the sawmills, in the utilizing of the immense quantities of sawdust by compression. Thousands of tons of sawdust are pressed into compact blocks and bales, and in this form is finding a ready market for kindling and fuel in the Eastern cities.

GLOBULES.—The taint of milk from sour or moldy ensilage is, it is said, removed by heating it to 130 degrees. The only way to get the turnip flavor out of milk is to heat the milk in a water bath to 135–140 degrees immediately after milking. This will completely eradicate the turnip flavor, and the milk will make good sweet butter. Milk is an animal secretion prepared in much the same way as are the tears, the bile, the gastric juice, the urine, the sweat, and the saliva. It is secreted in the mammary gland, or udder, by certain epithelial cells which manufacture it from the blood. It is well known that milk, especially as it is found in large cities, is usually swarming with living bacteria. Most of these are probably harmless vegetables; nevertheless they constitute a host of organisms entirely foreign to milk itself. The so-called "pure" milk ordinarily obtained in cities, even when it has not been tampered with, frequently contains in a tablespoonful millions of these microscopic vegetables, luxuriantly thriving in a soil most favorable for their development.—Farmer's Review.

People Who Ride.

There is no feature in the problem of rapid transit of such interest as that which relates to the average number of people in various cities who ride in streetcars. Accurate figures on this subject have been very difficult to obtain, owing to the fact that they could only be secured from the accounts of the different roads by special request, and these, as it is well known, are not kept with any idea of giving the statistician or engineer data for his calculations.

It is peculiar enough that the smaller the city or town the fewer are the rides which each inhabitant takes per annum. Doubtless this is owing to the fact that in such places the people are widely scattered and do not appreciate the economy of paying five cents to save five cents' worth of time.

Taking the average of nine towns, with populations varying from 4000 to 18,000, the number of rides per capita recorded for one year was 29, while in New York City the number of rides per capita was 144, or nearly five times as many.

The average for Chicago, Brooklyn and Philadelphia, three of the greatest street-railway cities in the world, by the census of 1890 was 169. As the cities grow nf less importance in point of population, the figures of passenger traffic also grow proportionately less. The average for four cities, with a population of 350,000 to 650,000, shows 143 per capita. Twenty cities, with population from 125,000 to 250,000, give 110. The average of five cities from 80,000 to 100,000 shows 95 rides per annum.

Some idea of the great amount of money that is each year spent for streetcar fares can be obtained with very little figuring. New York City, with a population of 1,700,000, at an average of 144 rides to each inhabitant, alone contributes no less than 216,000,000 nickels, or $10,600,000, into the treasury of the streetcar companies every year.

The elevated roads carried 215,000,000 passengers for the fiscal year ending September 30, 1892.—St. R. R. Gazette.

How Sponges are Gathered.

Arrived at what he fancied may prove a profitable ground, the captain of a sponging schooner sends out a boat to investigate, meantime standing off and on until a discovery is reported. Then all hands, save only the cook, or if she is a large vessel, the captain and cook, tumble into the small boats and the fishing—if fishing it can be called—is begun.

The vessel has towed astern just half as many boats as she has men in the crew, and now two men are assigned to each boat. One of them stands well aft and sculls with a long oar, while the other bends low over one of the gunwales in a most constrained position, and with head buried in a water-glass eagerly scans the bottom as he is moved slowly over it. The water-glass is simply a wooden bucket, having no bottom, that is held an inch or so below the ruffled surface, and these clear waters plainly reveal all submerged objects to a depth of 40 or 50 feet. As a further aid in overcoming ripples or moderate waves, each small boat is provided with a bottle of oil so hung over the bow as to slowly drip its contents into the water.

Through this magic glass the observer sees darting fish, richly-tinted seafans and feathers, branching coral, gorgeous anemones, bristling sea porcupines, and the myriad other curious tenants of these tropic waters. While seeing these he makes no sign, until a small, dark object that, to the untrained eye, differs in no respect from the loggerheads surrounding it, comes within his range of vision. Then, without removing his gaze, he reaches for the long-handled sponge-hook or rake lying behind him, and using it with one hand, quickly tears from the bottom a black, slimy mass that he triumphantly pronounces to be a sheep's wool or grass sponge of the first quality.—Scribner's Magazine.

IN transmitting electric-power from Lauffen to Frankfort, 108 miles, the actual loss of energy was 18 to 20 per cent in the triple process of transforming a current, of from 200 tn 300 HP., into a current of high intensity but small volume; transmitting this current over naked copper wires or ordinary telegraph poles, and finally transforming it again into a current of ordinary pressure. This is the result of an elaborate long-distance transmission test made last October by a committee of experts, headed by Professor Weber of Zurich. This report takes into account an initial loss of 8 to 10 per cent in the generating dynamos, which can be saved by more perfect construction.

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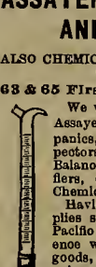

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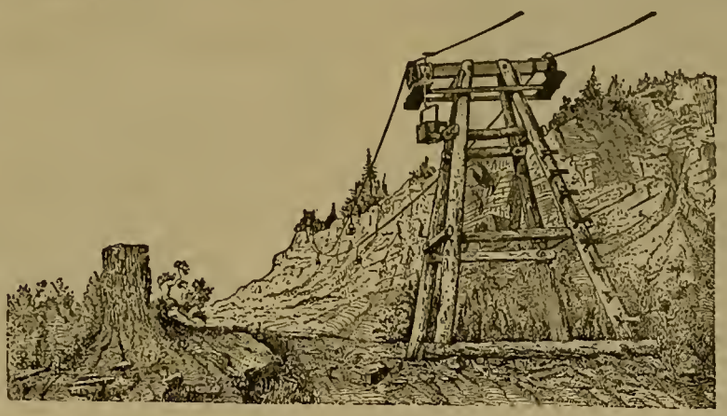

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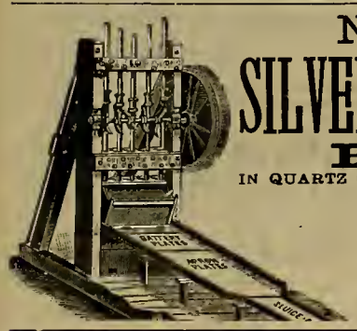

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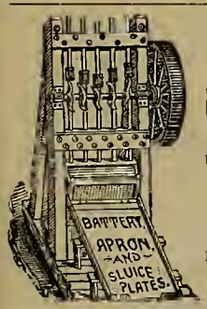

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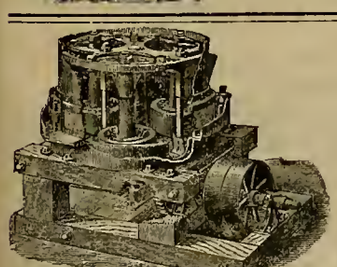

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Candle Power of Search Lights.

It doubtless often creates great surprise among those accustomed to dealing only with lights of from 16 to 2000 candles, to hear that the candle powers of search lights are in the millions and hundreds of millions, and statements to that effect are therefore often thought to be greatly exaggerated. While search lights may be somewhat overrated by the manufacturers, nevertheless their candle power is undoubtedly exceedingly great, and when the conditions are properly considered it is not so very wonderful that they should be so great. With ordinary lamps it must be remembered that the light is sent out in all directions, and that although an incandescent lamp, for instance, gives but 16 candles, it illuminates a large space all around it. If all this light could be collected, as it were, and passed out in one direction, the brightness wuuld increase very greatly. If, for instance, a lamp were inclosed in a hollow sphere one foot in diameter, having an opening in it of one square inch, and supposing it were possible to so reflect the light in the ioterior of the sphere that it would all pass out through this opening, then it can readily be shown that the candle power of the lamp *as seen through this opening* would be 452 times as great as it would be without this reflector. A 16-c.p. lamp would In that case give over 7000 candles. This is assuming theoretically perfect reflection and no absorption losses. If the sphere were two feet in diameter the increase would be over 1800 fold, or four times the former, as the beam of light now has only one-quarter the cross section. But in thus increasing the candle power 1800 times it must be remembered that the space around the lamp which is illuminated is now only one eighteen hundredth as great as it was before. In a well constructed search light by far the greater portion of all the light emitted from the arc is collected, as it were, and is sent out in the form of a parallel beam, and the fact that in the latter case it is so very much more powerful is therefore not surprising. It must furtbermore be remembered that such a beam of light, being composed of parallel rays, does not follow the usual law of decreasing inversely as the sqnare of the distance. If, therefore, such a search light were measured with a photometer at a great distance off, and its candle power calculated as usual, it is evident that the figure obtained would be that for a source which spread its light equally in all directions. It would, therefore, be much greater, perhaps hundreds of thousands times greater than the actual candle power of the lamp. Furthermore it would give a different result for different distances of the photometer from the lamp. While it is, therefore, quite correct to thus state the candle power of a search light, it must be remembered that the light is confined to a comparatively small beam, and that the actual candle power of the arc light by itself is very much smaller.—Electrical World.

Electrical Terms.

We have given in these columns several explanations and illustrations of the meaning of electrical terms by comparison. Mr. R. G. Davis, in the *Marine Review*, treats the subject in the following:

The whole question of electrical distribution may be properly illustrated by its analogy to bydraulics. The dynamo is essentially a rotary pump, but pumping electricity instead of water. If the discharge-pipe of a rotary pump be carried around through a given circuit and connected with a suction, both pump and pipes being full of water, the movement of the pump will obviously cause the water to flow in one direction, producing a continuous current of water. Substitute dynamo for pump, wire for pipe and electricity for water, and conception of electrical transmission by the continuous current is at once clear as to its elementary phenomena. We will bracket the analogous electrical terms; then we may say that a certain number of pounds [volts] of pressure is required to overcome the friction [resistance] of the pipe [wire] in order that the water [current] may flow at the rate of so many gallons [amperes] per minute. The larger the pipe [wire], the more water [current] can be carried and the less will be the friction [resistance]; or per contra, the smaller the pipe [wire], the less the quantity [amperes] per minute and the greater friction [resistance]. Manifestly, the pipe [wire] might be so small that the friction [resistance] would absorb a very large proportion of the power of the pump [dynamo], leaving but little remaining for useful effects; therefore the two horns of the dilemma are: If the pipe [wire] be too large, it will cost too much; if too small, the loss will be too great. The electrical appliances are also analogous to engineering appliances. The switches are valves, the reversible strips are the safety valves, the contacts are the pipe-fittings. If the contact is insufficient to carry the current, there will be a leak [drop] in the current. The volt meter is the pressure gauge; the ammeter is the same as the water or gas meter, the recorder of quantity consumed.

The "Tenderfoot" Engineer.

It is oot in the mining industry alone that the electrical engineer will meet with opposition from those who have gained experience, aided by mechanical devices of long standing. The most satisfactory electrical engineering has been done by men who have been trained mechanical engineers, seasoned with practical experience, who took up electrical work in its earlier stages, believing that such a combination would prove to be of tangible commercial value. That the number of these has been comparatively few, proves that we are creatures of prejudice, and there has been a disposition to scoff at the crude efforts of the young electrical engineer. This hilarity will be short-lived, however. No mechanic has ever passed through an apprenticeshlp without realizing that the path to success is encumbered with artificial as well as natural obstacles. No engineer or mechanic who is baffled by trifles has ever been born. He could not attain such a title unless he was gifted with ingenuity and perseverance, which enabled him to finally triumph. Persistence under difficulties has been a prominent characteristic of our greatest Inventors, and most of our young electrical engineers are by no means deficient in this important qualification. Whatever may be their standing today, they are winning respect, as their works speak for them, and many of them, beginning as electrical engineers, have acquired experience in mechanical engineering which is placing them well at the front as industrial experts. Ten years ago, all electrical engineers were "tenderfeet." With a good proportion, the period of probation has passed, and in a few years the profession will settle down to its permanent stage, in which the yearly increment of students will be but a small fraction of the whole. In that day the value of the experienced engineer will be relatively higher, while the neophyte will be compelled to prove in his subordinate capacity that he has not mistaken his calling. One of the most beautiful provisions of oature is that gradual process by which the perpetual rotation of the innocence of childhood, the vivacity of youth, the experience of manhood and the wisdom of old age unite in producing that variety of life which conduces to the most pleasing results. Modern industrial development is so rapid, however, that we are compelled to submit to the wasteful effects of crude appliances until experience has gradually led up to something better. The situation is hopeful, but we must be patient.

ELECTRICITY DEFINED.—The differeot opinions vary as the shades of colors of a rainbow. These also existed as to the *rationale* of electric agency, but modern science confidently asserts that the old idea of electricity as a "*fluid*" has been *exchanged* by the well grounded theory that It is a latent energy which may at any time be called into action by either cbemical or mechanical means, thus creating in the molecules of matter a modification of motion, which for simplicity has been appropriately termed an "electric current." The production of electrical phenomena may be brougbt about in three distinct forms: Static electricity, or *electricity in rest*, and producible by frictional excitation; galvanic electricity, or the *constant current*, generated by chemical, and possessing important chemical properties; faradic electricity, or *electricity induction* of secondary currents in an adjacent conducting body, by the actlon of the primary galvanic current or of powerful agents.—BLEYER.

STAMPING LETTERS. — An electrically controlled machine which will effectively stamp 30,000 letters in an hour is one of the interesting inventions that has been adopted in the postoffice department. The letters are placed upon their edges in a borizontal hopper, and an ingenious device carries one at a time between two feed-rolls. In this way the first separation is effected. A second set of feeding rolls performs another part of the work. In a simple way the inking rollers are reached, when the envelopes are stamped and passed on, one at a time, to the stacking table. A register shows the number of envelooes canceled. The date and hour in the die must be changed by hand. The various rollers are run by belts, passing over different-sized pulleys, which are in turn connected by gearing to the axle of the motor.

MARINE SET.—The Thomson-Houston Electric Company has designed and brought out a new marine incandescent dynamo, which is designated in electric nomenclature a "marine set," on account of there being a special steam engine built for driving the dynamo, the shaft of which is, so to speak, a continuation of the armature shaft of the dynamo, and vice versa. The dynamo is known at the Lynn factories as the "M. P. 32," being of the compound wound multipolar type, and regulating withio two per cent. An output of 35 amperes of current, at 100 volts potential, the armature rotating at 800 revolutions per minute, with the steam pressure at 100 pounds. The commutator sections are cross connected, so that only two sets of brushes are used. The rheostat, or resistance regulator, is incombustible, while the hearings on the engine and dynamo are self-oiling, with a few sight feed oil cups. The engine is manufactured especially for the dynamo by the Case Engine Company, of New Britain, Conn. The entire set weighs only 900 pounds, and both engine and dynamo occupy a floor space of only 40x20 feet.—Light, Heat and Power.

THE NEXT STEP.—An advance movement in electric-power distribution for which everything appears to be ready is electrical farming. With a power wire running along the turnpike and branches to the several farms or fields, it will be easy to draw the gang-plows and mowing machines, churn the butter and thresh the grain without the employment of the farm horse; and by the same means, with the addition of electric motors to the farm wagons, the produce can be carried to market. The advantages are so obvious, and the adaptability of electricity for the work so clear, that it is only the question of a short time before the thing will be accomplished.

AT Lowell, Mass., a new electric head light is being tried on the cars. It is placed near the top of the car in the center of each end and consists of an incandescent lamp surrounded by a powerful reflector. The light given is strong and strikes the ground 20 feet from the car. It may prove a great advance over the heavy lanterns now in use.

WASTE PRODUCTS.—Some striking facts in connection with the utilization of what used to be called "waste products" are cited in the *Pharmaceutical Journal*. As is well known, the ammoniacal liquor from gas works has been for many years the chief source of ammonia, the annual production of sulphate of ammooia from that material being upward of 100,000 tons. But more recently the llquors obtained in the distillation of shale have been turned to account as a source of ammonia, and more than 25,000 tons a year of sulphate of ammonia have thus been obtained for some years past. The products of combustion from iron furnaces have also been subjected to treatment, by which the ammonia contained in them has been obtained as sulphate of ammonia to the exteot of 6000 tons a year, together with a quantity of tar. To such an extent has this proceeding been carried that in some instaoces the capital expended in plant for that purpose exceeds that devoted to the smelting operations. It is estimated that in Scotland alone nearly half a million of money has been expended in this way at iron works.

WHITING, plaster of Paris, barytes, silica and white clay are the commonest paint adulterants. A recent lecturer showed a number of boards painted with three coats of these materials that had been ground in oil. In each case the grain of the wood could readily be seen, while the coat of white lead was sufficient to practically cover the grain.

IN France there is an unwritten but immutable law that a painting shall not be exhibited without the artists' consent, no matter what the wishes of the owner may be. Aod now a literary and artistic congress in session at Milan, Italy, has decided that the right of reproduction does not pass to the buyer of a oicture.

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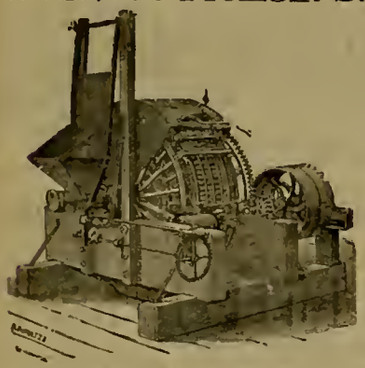

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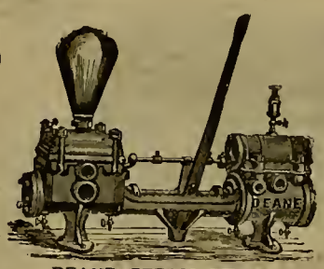

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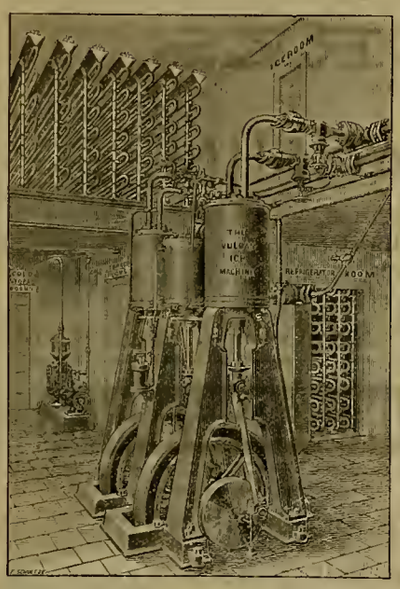

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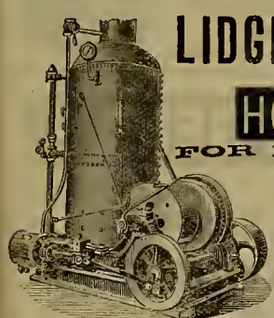

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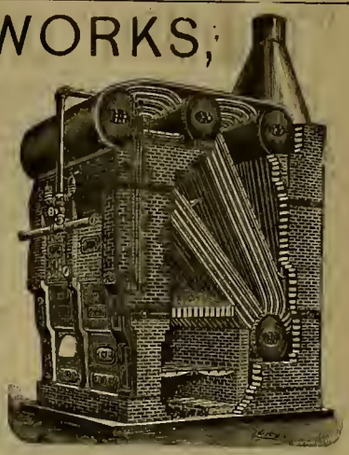

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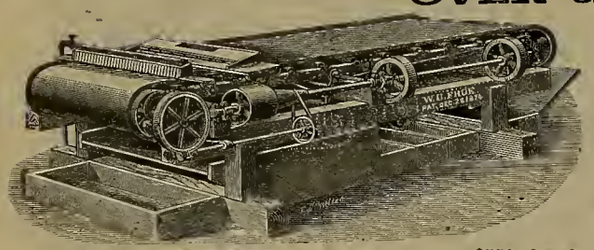

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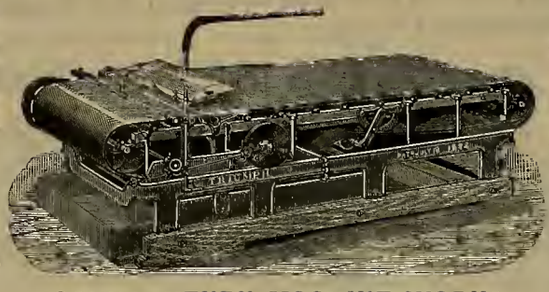

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Location of Worke, Grass Valley, Nevada Co., Cal.

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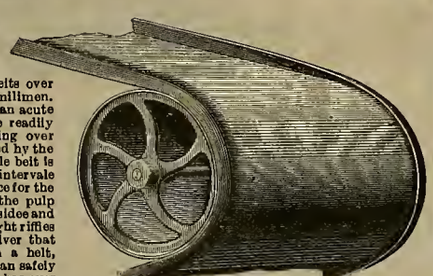

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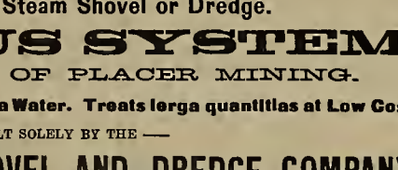

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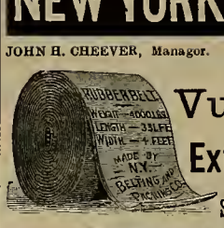

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

KEYSTONE.—Amador *Record*, Dec. 22: Superintendent Hale on last Monday resumed active operations at the Keystone mine by putting to work 20 miners. The ore house is being filled and the mill will be started up again as soon as some necessary supplies therefor can be received from the East. An additional force of men will be put on soon. With the exception of running five stamps and keeping the water out of the mine, work has been virtually suspended for a few weeks past. This mine is one of the old stand-bys for Amador City, and the people here are much pleased to see the work going on as usual. It is rumored that the Bunker Hill mine folks will pay off their indebtedness at the rate of 50 cents on the dollar within a very short time. As there is a considerable amount due here to old employes and others, the payment of the debts will add to the circulating medium and make a corresponding increase in business all around. There is no doubt, also, that the mine is to be worked again on the old-time scale. Altogether the mining outlook here is very encouraging. The South Spring Hill mine is going along at its usual pace under the able management of Superintendent Tregloan.

THE HARDENBURG.—Amador *Ledger*, Dec. 23: Messrs. Lane & Hayward, of the Utica mine at Angels, are negotiating with S. A. Howland for his bond on the Hardenburg. The prospects are very favorable for their securing the property, the only obstacle being a clause in the bond which the Angels people do not like. The interested parties went below last week to try to have the clause altered. Lane & Hayward propose to put a large force of men to work if they get the property, and make a thorough prospect. Since writing the above, we have ascertained that the Utica people have taken possession of the Hardenburg and are making arrangements to go to work immediately. Knight & Co., the foundrymen of Sutter Creek, have been awarded the contract to overhaul and repair the machinery forthwith. The new managers will sink 200 feet more, running levels, etc., and while the underground work is progressing, they will probably keep the ten-stamp mill running on exposed ore.

THE ALBANY.—The Albany gold mine, of which J. H. Tibbits of Sutter Creek is superintendent, is owned by a California corporation, whose property consists of five claims on the Mokelumne river, near Middle Bar. Mr. Tibbits has ten men at work there at present, and the prospects are very flattering for an increase of the force in the near future. The people at the back of this enterprise have had extended experience in quartz-mining in Amador county, and have great faith in the prospects of the Albany. That business-men of this town and of Sutter Creek have confidence in this enterprise, and in the ability of the able young superintendent, is readily evidenced by the fact that 20,000 shares of the stock have been taken and paid for in these towns.

NOTES.—S. G. Spagnoli, since leaving the clerk's office, has engaged in mining on some of his property near Clinton. He is at present getting ready for work by building reservoirs and ditches. The men on the night shift at the Clinton Consolidated became apprehensive as to their wages, which were due, and quit work Monday night. The day hands went to work as usual Tuesday morning. C. E. Gunn, secretary of the company, came up from San Francisco, Thursday, prepared to pay off the employes, which he will do to-day or to-morrow. Negotiations are pending for a bond on the Good Hope mine between D. Gutmann, capitalist, and Chas. Peters, the owner of the property. The Good Hope is located in Jackson. The Bratiania quartz mine, located at the mouth of Gwinn canyon on the Calaveras side of the Mokelumne, has been bonded to San Francisco parties, who will thoroughly prospect it as soon as the weather will permit. Supt. Chambers, of the Volunteer, expects in a short time to receive instructions from A. P. Minear to put a night crew at work in the mine.

Humboldt.

OIL.—*Western Watchman*, Dec. 24: Last advices from the oil well at Garberville report 1984 feet depth and everything working well; change in formation. Secretary O'Neil has received a map of the well which shows the operations very clearly.

Nevada.

ANOTHER INJUNCTION.—*Herald*, Dec. 23: A writ of injunction has been issued in the case of the County of Yuba *vs.* The Kate Hayes Mining Company, a corporation doing business in Nevada county. The plaintiff asks that a date be fixed for a hearing in the case and that the mine be perpetually closed. C. W. Cross, attorney for the company, has filed a demurrer to the complaint on the usual statutory grounds. The mine, which is located at French Corral and is better known as the Milton, has been working by the elevator process. N. C. Miller is superintendent, and quite a number of men are employed.

KING SOLOMON MINES.—Grass Valley *Telegraph*, Dec. 23: Last evening the directors of the King Solomon Mining Company held a meeting at the Citizens' Bank. Everything at the King Solomon is in good condition, and all machinery necessary for the profitable working of the mine is on the ground ready to be erected. The King Solomon is situated among a group of mines, including the Delhi, Enterprise, Live Oak and Grizzly, all of which are taking out ore and employing from three to 20 men. Under Superintendent Brockington's management we feel sure the King Solomon will come to the front rapidly.

THE BRUNSWICK MINE.—The prospects of this mine have improved very much in the last two months. A fine shoot of ore has been cut in the west drift, 600 level, and good ore also in the shaft and east drift. Sixty-five tons of good milling ore are in the bin and some on the dump. As the ore goes down to the level below, so far as can be seen, it looks like a good milling proposition. We are informed that Major Fitzgerald, the superintendent, resigned this month and a Grass Valley man takes his place. The major deserves great credit for his good, economical management of the property. It was a total wreck when he took charge, and when our reporter visited the Brunswick everything was in first-class order. We are sorry to have Major Fitzgerald sever his connection, as the chances are he would have made a paying mine of it. He intends to stay in the county, as he has interests in mining property here.

GRAVEL.—*Transcript*, Dec. 23: It is reported upon good authority that negotiations are now going on for the sale of three quartz and two gravel mines in the vicinity of Nevada City. A gentleman who is well posted upon what is going on told the *Transcript* reporter that he was confident that from four to six hundred men, in addition to those already employed, would be given work within six months from this time. He tells us that the Fountain Head and Cold Spring gravel mines will be consolidated and worked by San Francisco capitalists. The old Fortuna, Sneath & Clay, the Sharp, and two or three other mines upon which little or no work has been done during the past 15 or 20 years, will be in full blast. This certainly is very encouraging news.

THE NORTH BLOOMFIELD MINE.—The antidebris people are paying particular attention to the North Bloomfield gravel mine since Judge Gilbert of the U. S. Circuit Court, made an order so modifying the injunction that the company can continue hydraulic operations under certain restrictions. To show the condition of the mine and the restraining works that are being provided, the Anti-Debris Association gives the following in address to the people of the Sacramento valley: "The upper mine of the North Bloomfield Mining Co. is located one mile below the town of North Bloomfield, 18 miles north of Nevada City in Nevada county. The company has patent to about 600 acres of ground, the larger part of which will be washed down with the monitors if the company is permitted to work by this process. The banks at the face of the works at the upper end on each side of the Malakoff ravine are in depth from 200 to 250 feet, and as they work to the north and east will increase in dimensions. The serious question which the managers of the Anti-Debris Association are now considering is, what is to become of the vast amount of earth when the reservoirs and restraining works will not hold one-quarter of it with all the capacity they are able to get in the ravine below before reaching the water. To determine what part of this is held in the two settling reservoirs built by the company and how much escapes and finds its way into the river, the representatives of plaintiff Woodruff will have a survey made as heretofore stated to determine what amount is restrained. A brush dam is built across the excavation a little more than half way from the present face of the mine to the lower end, where they first commenced work. Below the dam the excavated space, which has been worked to the bedrock, covers an area of not far from 14 acres, and the average depth is probably from 60 to 75 feet. In the upper part of this lower reservoir, just below the brush dam, is located the crib work, and when this reservoir has been filled to the top of the crib the water will run out through it and is then carried by the flume to the ravine of Humbug creek, thence to the river below. There is another brush dam being built above this one, but it does not cover the entire width of the excavation, yet will, when completed, form a reservoir with capacity similar to the one below. The managers of the mine claim that these reservoirs will hold an immense amount of material, and that while they are at work will, by excavating a large surface, have room to build one or two more of the same kind. The mine, when at work with four large-sized monitors, three of them now being in place at the upper face of the mine, with the usual run of 3000 inches of water, will wash down an average of 10,000 cubic yards of earth in each 24 hours' run. Figuring on the capacity of the lower settler, and it will hold between 75,000 and 100,000 cubic yards of earth, and if we continue the calculation, it is a difficult thing to see where they are to store the accumulation of even one season's run. It is claimed that the first 100 feet from the top down will average from two to five cents per cubic yard, and the second 100 will average from five to ten cents, while the balance next to the bedrock will average from 50 cents to $1.50. A little more than half way down there is a strata of pipe-clay from 70 to 90 feet in thickness, and this is the material mentioned by Judge Gilbert in his decree as "flocculent" and carried in suspension with the flow of water. Alongside of the upper reservoir in the excavation there is a tunnel which is arranged so that the flow from the face of the mine can pass through it and out into the reservoir of Humbug creek and not pass through either of the settling reservoirs. The managers of the mine claim that they do not use this only on rare occasions when the works above get choked up so as to require relief by this source.

The managers of the Anti-Debris Association have doubt about this and say they wish to place a measurement on the works now and another after a run of three months, then they can determine if the mine is being run in good faith and to comply with the decree of Judge Gilbert, and at the same time give the restraining works full credit for what they do.

San Diego.

LITHOGRAPHIC STONE.—San Diego *Union*, Dec. 23: Two specimens of lithographic stone of different texture and color have been left at the Chamber of Commerce by John H. Bunton of Julian. The ledges, from which the specimens come, were discovered in the Julian mining district by Mr. Bunton, and he has sent samples of the stone to the State Mineralogist to determine if it is of the requisite quality for lithographic work. The report from the mineralogist has not yet been received. True lithographic stone is of peculiar textnre, and so far has not been found in the United States, unless the recent finds in Yavapai county, A. T., should prove of value. The world's supply is furnished from Bavaria and is said to be limited in size and quantity.

Shasta.

REID MINES CONSOLIDATED CO. — Redding *Free Press*, Dec. 24: Sam Hendy of the Joshua Hendy Machine Works was in town Sunday, and, along with Colonel Stevenson, visited the works of the above company at Old Diggings. He inspected the new hoisting works just erected, the sorting sheds, and went down the main shaft which is now being sunk on the Spanish claim belonging to the Reid company. Mr. Hendy was highly pleased with all he saw, and gave Mr. Russell, the superintendent, great credit for the workmanlike manner in which the work had been executed. Mr. Hendy and Mr. Stevenson had under consideration the erection of a 20-stamp mill on the Sacramento river, about half a mile distant, beside the Texas and Central mills, on ground which has been bonded by the Reid company. We learn that the directors of the Reid Mines Consolidated Co. propose to use the proceeds on all ore shipped in developments on their extensive properties, instead of declaring dividends at present, and they have accordingly let a contract to build a wagon road from the Spanish shaft to the Sampson tunnel, and have also contracted for completion of the Sampson tunnel to the main ledge of the mountain, which is expected to be reached in another 200-foot tunnel. The mill belonging to the Reid company on the other side of the mountain is being run on ore from two ledges on that side, with what result we have not yet learned. Every indication goes to show that this immense property will prove one of the most valuable in the State. From a recent assay made by Prof. Price of San Francisco on a piece of quartz, with sulphurets taken from 80 feet depth in the main shaft, the assay showed: Gold, $1385.01; silver, 115 ounces; total, $1500.01 per ton. The same kind of rock at 60 feet depth in the shaft gave by Falkman's assay $603 per ton, showing that the sulphurets are increasing in value with depth. These pieces of rock were half quartz and half sulphurets, so that the pure sulphurets would go double those amounts. The visible gold in the rock is becoming more pleotiful and coarser.

CROWN POINT MINE.—It has been some time since Mr. Parker of the Crown Point Mining Company started his crosscut to tap his ledge on Mule mountain, and he has been working under many difficulties. But early this week he encountered a well-defined ledge about 200 feet from the commencement of the tunnel, and about 156 feet from the surface of the ground. On December 17th he made the strike, encountering ore which assays all the way from $50 to $500 per ton. The rock shown us was certainly well mineralized, and Mr. Parker states that he is four feet into the ledge, and, from the indications, not half through yet. When he cuts the ledge entirely he proposes to drift north and south, and also run an upraise to connect with a shaft down some 80 feet, shipping the best ore to Linnton, Oregon. This crosscut was made to determine the richness and extensiveness of the ledge by the shortest possible tunnel. He expects soon to commence a tunnel on the ledge itself, which will tap it 500 feet from the surface. Mr. Parker has five men employed, who are well housed and comfortably provided for. He also has the ground prepared and the timbers out for the erection of concentrating works.

Sierra.

GOLD BLUFF MINE.—*Mt. Messenger*, Dec. 24: Work is satisfactorily progressing at this ledge. The mill is being rapidly erected. The lower steps frame is all up, and part of the building main timbers are in position. Three loads of machinery came in by Trainor last Sunday. Four loads are on the road between Camptonville and Downieville. The balance of machinery, except about a carload of piping, etc., is ready to be hauled from Nevada City, Trainor, with other teams, will have it all here within ten days. Lumber and timbers are nearly delivered. Last Sunday a number of Downieville people were up there to inspect the work, and seemed very much pleased with it. Supt Kraft is energetically laboring to get under cover before winter begins in earnest, and has 46 names on his payroll.

NEVADA.

Washoe District.

CON. CALIFORNIA AND VIRGINIA. — Virginia *Enterprise*, Dec. 25: On the 1500 level the south drift leading to the stopes has been closed. This drift has a winze connection at the south end of our mine openings with the 1650 level, and is near the point where the fire started on that level. The closing of the south drift was necessary, as the good air coming from the 1500 level, north drift, turned and went down the Con. Va. shaft to the 1650 level, then south to the point of the fire, and upward through the upraise to the 1500 level; thence through the south drift to the Combination shaft, and upward to the surface. The result of the turning of the air current was to give good air to the burning stope and increase the gas and smoke coming through the south drift to the shaft station on the 1500 level. The closing of the south drift has again turned the air, so that the combination shaft is upcast from the 1650 level to the surface. The 1500 level south drift is a level plane without any grade, and by building a three-foot dam across the drift at its mouth and turning in the water, it flows through the drift and down the upraise to the 1650 level. We feel certain this water will reach the fire and accomplish a great deal of good in a very short time. All our bulkhead work on the C. & C. side of the mine is in perfect order. The gas escaping through the Con. Virginia shaft has not increased, nor has it shown any decrease for the past three days. All ore extraction has been suspended during the week. Have shipped to the Morgan mill during the week from our ore bins 310 1270-2000 tons of ore, the average assay value of which, per car samples, was $28.11 per ton. The average assay value, per battery samples, of all the ore worked at that mill during the week (816 tons) was $29.15 per ton; 505 730-2000 tons of the ore worked was on hand at the mill, and, being of better quality than the ore shipped from the mine during the week, will account for the value of the battery samples being in excess of the car samples. Bullion shipped to Carson Mint, assay value, $18,134.73. Bullion on hand in our assay office, assay value about $30,000.

OPHIR.—1465 level—The upraise started on the sill floor, on the north side of the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 feet below the sill floor of this level, has been carried up 7 feet; total height, 45 feet, continuing in porphyry showing lines of quartz.

MEXICAN.—On the 1465 level the drift run north from the crosscut run east from the bottom of the winze sunk 101 feet below the sill floor of this level, near the south line of the mine, has been advanced 18 feet; total length, 413 feet; continuing in a porphyry formation with lines of quartz.

BEST & BELCHER.—200 level—On this level the northwest drift has been advanced 22 feet during the week; total length, 108 feet, through soft porphyry and quartz. 900 level—West crosscut No. 2 has been extended a distance of 105 feet and discontinued; face in porphyry. Started west crosscut No. 3 from top of raise No. 1, which was carried up from the 1000 level, and advanced same 12 feet; face in porphyry.

GOULD & CURRY.—200 level: West crosscut No. 5, 435 feet from main west drift, has been advanced 20 feet through porphyry and stringers of quartz; total length 197 feet. West crosscut No. 6 from main north drift has been extended 9 feet; total length, 45 feet; face in quartz. On the Sutro tunnel level, the joint north drift with Savage Co. has been advanced 15 feet during the past week; total length, 759 feet; face in very hard porphyry.

EAST BAST & BELCHER AND NORTH GOULD & COARY.—Are drifting from East Best & Belcher toward North Gould & Curry. Going through porphyry with favorable indications in the face.

OCCIDENTAL.—The upraise from south drift, 750 level, is up 51 feet; top in low-grade ore. The north drift, 750 level, has been extended 18 feet; face in hard quartz giving low assays. Crosscut No. 2 in Zadig drift, Sutro tunnel level, has been advanced 16 feet; total length, 87 feet. The face is in clay and porphyry.

HALE & NORCROSS.—We continue retimbering main shaft above the 700 level. Main Incline—Are making the necessary repairs, and are retimbering incline above the 1800 level. 1800—Advanced No. 1 west crosscut 16 feet; total length, 255 feet. The face at this distance reached the west wall and work was discontinued in this crosscut. West crosscut No. 3 was advanced 17 feet; total length, 192 feet; face in porphyry, showing some quartz. Advanced No. 4 west crosscut 16 feet; total length, 44 feet; face in quartz.

ANNAS.—On the 420 level no work has been done in face of north drift No. 1, north, during the week. Work has been confined to retimbering and repairing main north drift.

Willow Creek District.

A MILL AT WORK.—*Silver State*, Dec. 23: The merry rattle of a quartzmill will soon again be heard at Willow creek, north of Winnemucca, announcing the renewal of activity in mining operations in the old camp. The mill will be erected at the Caledonia mine, which is owned by a company of which Dr. Hanson, of this place, is one of the principal stockholders. A short time ago the company purchased the Silver Wave mill, which had not been run in years. The machinery, however, was in perfect order, and as good as new. The mill was situated about four miles from the Caledonia, and has been torn down and hauled to a site near that mine, where it will be reconstructed. J. L. O'Donnell, James Hill and Ed. Rinkel, experienced millwrights, are on the ground, and the work will be commenced immediately. It is a five-stamp mill, but more stamps will be added if returns from the ore justify it. There is hardly any doubt but what its capacity will be increased very soon, as the Caledonia is showing up well, the vein being wide and the ore rich. Shipments of gold bullion from Willow creek will soon be in order.

Alum Creek District.

NOTES.—Walker Lake *Bulletin*, Dec. 21: Johnny Dock, of Piute, is working the Nip and Tuck on a lease and is taking out pay ore. He took out 16 sacks last week of $40 ore. This mine is owned by Hatton & Box. Chas. Jump will begin work on the Johnny Dock mine next month. A lot of ore from this mine is now being worked at the arrastre. Frank Williams is doing assessment work on the Carbonate mine of Knapp & Millsaps. The prospects are

encoureging in this mine. The Red Cloud Co. (Hatton, Webber & Box) hes just completed a very comfortable cabin in Alum creek. Hacket & Hemmond are working in the Central mine. The vein in thie claim is very small, but the ore is of very high grade. The prospects are good.

ARIZONA.

YAVAPAI COUNTY PROPERTIES. — Chapparal Gulch Cor. Florence *Enterprise*, Dec. 23: Your correspondent has lately visited the different mines in this district, with the following resolt: At the Jessie, Frank L. Wright is taking out the nsuel amount of high-grade shipping ore, and is about ready to commence stoping, and expects to ship three or four carloads monthly hereafter. At the Jones mill, he found all the pipes frozen up and the mill shut down, the resnlt of the late cold snap. At the McCabe group, Mr. Packard, of Denver, and Hon. Ed. W. Wells, who purchesed McCabe's Sink to Rise mine lest week for $40,000, have 20 men at work building houses and taking out ore, of which they have shipped 60 tons since their purchase of the mine, and have about 50 tons on the dnmp waiting sacks. J. W. Cover and J. D. Helm are working McCehe's Gladstone mine under a lesse and hond, and have developed one of the greatest gold mines of the country. Their sheft is entirely in ore and they are leaving about 28 inches of ore elong the wall outside the boundaries of the shafr. This ore will sample $60 and $100 in gold per tou. A sale of this mine is on the tapis and will probably be consummated about the first of Jauuary. I also visited the Bonanza, owned by Judge J. R. Slack and Joe Mayer of Mayer station, and found they have sunk a shaft 37 feet, drifted about 25 feet and followed the drift with one stope, and have 60 tons of ore sacked for shipment and about 30 to 40 tons sorted for sacking, which all samples $165 per ton. They are now shipping the ssoked ore to Jones' mill for treatment. This mine, which they have named the Yankee Girl, is different from anything in tbe district, being entirely in a soft porphyry lime, with no walls yet in sight. The ore var es from two to four feet in width and is phenomenally rich. A grab-sample taken by myself from the dump and reduced in a pen showed approximately $100 in free gold. Another sample I estimated at $100, and a piece of herd ore, selected by Mr. Slack for me and prospected in a pan, was estimated at $500 in free gold per ton. Messrs. Slack and Meyer nndoubtedly have a very fine prospect, one of the richest it hes been my privilege to semple. A. L. Butler, formerly interested with F. L. Wingle in the Jessie lease, has taken a lease upon Henry Lang's Legel Tender mine, and has a force of men at work. Frank L. Wright has taken a lease upon the Chloride of Jack Owens. These two latter claims produced some very rich free gold ore lest seeson, and are expected to turn out veritable bonanzes shortly.

WHITE HILLS.—Kingman *Miner*, Dec. 23: The most fortunate miners in White Hills are those who are able to secure leases on some of the claims that secure rich ore. The quelity end the quantity of the ore may be estimated when it is stated that in some instances the 35 per cent royalty is paid and then from $6 to $10 is realized to the man. The White Hills Mining Co. now has on the cers, at Kingman depot, two friction hoisting works for transportation to the Hills, and as soon as these are in place there will be a show for more men to work. At present not over 40 or 50 are working for wages or contract. Most of the work done so far bas been by contract, and was all in the way of development work. Top wages have been reduced to $2.50 per day, which has caused some dissatisfaction among the miners. It is not likely that there will be any trouble over the reduction.

EUGENE CAMP.—Another coming rich camp is Eugene Camp on the opposite side of Sacramento valley. There the Horn Silver and Eugene mines rival the best mines in White Hills, the ore in its richness and general physical charecteristics bears a close resemblance to the Occident mine in White Hills. On the Horn Silver the main shaft is down 60 feet, and Messrs. Washington and Maloney heve a contract to sink it 100 feet for the ore they take out in sinking, and it is no mean prospect that better then contract wages can be made by sinking, and it costs $30 per ton, too, to get the ore hauled to Kingman. Eugene Camp has some 20 men, a new boarding-house and a good show to become as good a camp as there is in the Territory, notwithstanding that, like White Hills, water is scerce and high.

SILVER.—Jack Gibbons and Ed. Mervine are reported to have discovered a rich silver ledge in Aubrey district, about a mile and a half due west from Groom's Peak. The ledge is five feet wide, the ore of gray copper and runs 275 ozs. in silver per ton. It is said by old-timers that this was a lost ledge and that a number of prospectors have eearched for it off and on for the past 20 years. Parties who have seen the ore say it will rivel eny strikes made in Indian secret district or anywhere else.

MINING AT PIONEER.—*Enterprise*, Dec. 23: John Newman, Esq., bought his partner's (A. Finlayson) interest in the Pioncer and other mines in this camp on the 28th of lest month, and is now sole owner of most of the mines in this cemp. John has several bodies of high-grade ore in sight, and hundreds of tons of low-grade that he will have worked in Globe, at Klein & Co.'s mill. Kelly & Reinhart have struck a fine body of very high-grade ore on the ground that they have leased and will soon have out a large shipment. Donivan & Bartlett shipped several tons of rich ore a few days ago and are still taking out plenty of the white metal. Miller, Payton & Co. will soon ship a carload of rich ore to El Paso. Gordon & Norton have made a rich strike on the North Howard. Geo. Bird & Co. are doing well on the Old Pioneer mine and will ship as eoon as silver comes up a little higher. There are several men making good wages assorting and screening the old dnmp that the company took out years ago. Newman expects to put in a pumping plant in the spring, so as to work ont the high-grade bodies of ore that are known to he below the water-level.

BRITISH COLUMBIA.

THE NEW CAMP OF LARDO.—Butte *Inter-Mountain*, Dec 23: Mr. F. E. Ward left the camp of Lardo two weeks since. According to Mr. Ward, it was only discovered last Septemher. It is about 200 miles north of Spokane. From Bonner's Ferry one can go hy eteamhoat and rail and steamhoat to Kalso, on Kootenai lake, thence across the lake 20 miles hy boat, and from the head of the lake to the Lardo region it is 60 miles, and not a sign of a trail or road. Over this 60 miles the proepector must walk and carry his blankets, gruh and tools along the Lardo river to the mines. Mr. Ward made the trip last September and has no cense to regret it. He was among the first to get in, and eucceeded in getting what he considers valuable property. The leads thus far discovered were found in a lime and slate contact. The lime dike tends northeest and sonthwest, is from 1500 to 2000 feet in width, and rises up nearly perpendicular to a height of 2000 to 3000 feet, and is nearly as white as snow. The slate is black. The surface ehowing, Mr. Ward says, is the greatest ever known. The Abbott claim, chief of the C. P. R. group, he says, has 40 feet of galena ore that has an averege value of 80 ounces of silver to the ton. All the ore, thongh galena in character, runs high in gold. There is an abundance of timher and plenty of water. The timher is described as very fine. The mountains are covered with cedar trees eight to ten feet thick at the butt, and towering 100 feet withont a limb. From Lardo to the Canadian Pacific it is 75 miles. There is not a sign of a trail or road, hut the Government is now building trails for peck animals, and within a year it is thought railroads and wagon-roads will be constructed. The Cenadian Pacific will probably huild down the Lardo river, and the people of that section are confident Jim Hill will construct a branch roed north from Bonner's Ferry. The trade is already very heavy, and there are not enough steamboats on Kootenai lake to transport the goods to Kaslo, and in the winter nearly all freight treffic is snspended, owing to the ice. More than 30 locations have been made on the great coutact vein of Lardo, each 1500 feet square.

COLORADO.

ASPEN SHIPMENTS.—Aspen *Times*, Dec. 24: The railroads report the shipment of 3113 tons of ore for the week, au increase of abont 1000 tons over the ureceding week. There is no reason why it should uot be double this amonnt unless it is the continued depression in the silver market. The bonanzes themselves ere all looking unprecedentedly well, and are probably, at the present time, cepable of furnishing a larger amount of ore to the market than at any period since they begau their career. The low price of silver and lead, however, has been a sonrce of embarressment that they conld not overcome, and the result is seen in the curtailed shipments. However, the shipments are very favorable, and Aspen can rest its reputation upon them.

IDAHO.

THE BEDROCK FLUME.—Cor. Idaho *Statesman*, Dec. 23: Benjamin Williams, who has been in the Basin for several weeks prospecting the placer ground in Grimes and Granite creeks to ascertain whether it will justify his company to put in a hedrock flume, will soon leave for Engla.d. As near as can be ascerteined the prospects were very satisfactory, and we ell hope and expect to see the work of putting in e flume commenced early next spring. The sand washed down from the hydraulic claims on the mountain sides all prospected much better than was expected, while the ground in the creek beds wes found to be good. This is one of the greatest enterprises sterted for the benefit of the country, as we all know that it will pay handsomely and bring capital for investment in other enterprises. The trustees of the Boise County Mining Company are making arrangements for the purchase of new machinery, so that when work is resumed in the shaft it can be continued without interruption until the granite bedrock is reached.

MEN LAID OFF.—Wood River *Times*, Dec. 21: About 25 men have been leid off at the Red Elephant group of mines. Only 50 or 52 men are therefore employed there now. They are all working in ore, however. The output of the property will, therefore, not be curtailed at present. Most of the men laid off were $4-a-day men. All of them were doing dead work. They were laid off for three or four months. Colonel Bryan, maneger of the [G. V. B.] Company and principel owner of the property, says the outlook for silver is so unsatisfactory and unpromising that he does uot feel that he can afford to pay at present for any work that is not indispensable. This will continue as long as the present low figures for lead and silver shall rule.

RICH ORE.—Last Saturday a strike was made in the Goffre claim which, had it been in almost any other region, would cause a great rush there. The men at work there ran into mineral that has the appearance of a blue, ehiny talc all covered with green. It is filled with bromides and becomes bright on rubbing. There is a width of eight inches of this which assays $4987.50 per ton. The discovery was made at a vertical depth from the surface of 227 feet. The ground ie ao soft and kindly that the men had run about 42 feet in three days. The ore showe up in the top and bottom of the drift, carries some zinc, and gives every indication of permanency. A crosscut is being run at a depth of 109 feet below the above drift. As soon as the proper place is reeched, a raise will connect the crosscut with the drift above and a more reliable opinion of the extent or size and valne of the ore body can then be formed. The Goffre cleim is located at the Bullion divide and in the very heart or center of the most productive section of this region. The Goffre is owued by the Pass Miniug Company of New York city of which H. K. Thurher, the well-known millionaire head of the Thurher–Whyland Co., is treasurer. Nathan Randall is the snperintendent, and has charge of operations at the mine.

THE CLIFF.—Idaho *Avalanche*, Dec. 23: This property, on the eastern slope of Florida mountain, is owned hy John Way, Fred Harris and Sheriff McCehe. They have three claims which adjoin the Miller & Walters mine and the Naked Truth. Something over 800 feet in tunneling has been done on the property, and a fine body of ore has recently heen opened. An assay made recently on an inferior sample run 604 ounces in silver and 10.20 ounces in gold, or $808 per ton. The rich streak is from 7 to 12 inches in width. Several tons are now on the dump and a mill-run will soon he made.

BLACK JACK.—A large force of miners is at work on this property, and the mill is running eteadily. The work in the mine consists of drifting south on the ledge and in stoping. The mill is doing excellent work. There is a report in town that John Feonr and Taylor Gearhert have struck a fine body of ore in their claim ou Florida mountain, where they have been working the past summer. The strike is said to be rich and in snfficient quantity to be valuable.

BLAINE.—The tunnel hes reeched a length of 2075 feet, and is being pushed as rapidly as possible hy three eight-hour shifts. The stope is looking fine and has abont 12 inches of $250 ore. The face of the drift is in fair quartz.

TRADE DOLLAR.—There are 26 men on the payroll. Stoping is being done in the uorth drift of the 100-foot level of Winze D and in tunnel No. 3, over the winze. The south drift of the 100-foot level is being driveu also. The mill made a cleanup this week and has shut down for want of ore. As nearly all of the milling ore has to be hoisted by hand, it is impossible to keep the mill running steadily. The mill will he started again about the first of January. Dunham has two teams hauling quertz from the Black Jack mine to the mill. Three teams are uow engeged in hanling ore from the Phillips & Sullivan mine.

NEW GOLD FIELDS.—Elmore *Bulletin*, Dec. 23: Dr. Sawyer has discovered good placer diggings on the head waters of the Bruneau, a stream that empties into Snake river about 20 miles south of Mountain Home. This is known to the prospector as the Bruneau country. The doctor spent all his time last summer in exploring this region to determine the value of the dirt in a plscer belt on which he had taken an option. He found the earth very rich turning out from two to 25 cents per pan of the precious metal, and it was not unusual to pick up nuggets worth $25. There is a large stream that empties into the Snake river which effords plenty of water, and a fall of 1000 feet can be had for hydraulics. There is a ten mile ditch and 2000 inches of water. Two men have been washing gold in the gulch for several years, taking out $750 in the couple of months that they can utilize the snow water. This they deemed an ample return for their wants, being few in the simple life they fol lowed, 50 miles away from civilization.

NEW MEXICO.

INCREASING OUTPUT.—Silver City *Sentinel*, Dec. 23: The output of the mines in the Hillsborough district is increasing, and the total output last week was over 400 tons of ore. The Staudard Company's mines are producing ore enough to keep two mills running steadily. The concentrator at the Stephenson-Bennett mines, in the Organ mountains, is nearly completed, and it will be started next month. There are about 6000 tons of ore out at the mines, and it will he treated at the rate of 50 tons a day. Pete McDermott shipped 30 tons of high-grade ore from his mine near Carlisle last week. The ore will average about $100 per ton, and has all been taken out in doing development work on the mine. He is still working in fine ore. The mines in the Tres Hermanas are producing ore in small quantities, and shipments of good ore in smell lots are being made from the camp at regular intervals. Most of the ore from that camp is being shipped to the Deming Sampling Works. The assay office of the Deming Sampling Works, which was burned recently, will be rebuilt at once. Development is being pushed on the Jim Crow mine in the Carlisle district, and the indications are good for a veluable body of ore. Wheu the development work, now coutemplated, is completed, the purchasers of the mine will have a pretty good idea of the extent and value of the ore depoeit. Developmeut work is going on at the Mangas Mining Company'e property, but a mill will not he erected until there is a hetter proepect for a higher price for silver. The company has a large body of ore in sight, hut there would be little profit in taking it out and reducing it at the present price of silver. W. S. Hopewell will put up a 15-ton Hontington mill near the Homestake mines, on the Animas river. The machinery for the mill has been shipped from Lake valley to its destination. The new mill will be just what the miners of the Animas Peak district have been wanting for a long time. The ore from the mines there can be treated in the new mill much cheaper than it can be shipped and treated elsewhere. Miners at Cook's Peak are considerably concerned on account of the low price of lead, and shipments from the camp are falling off. With lead at four cents a pound, the mines there can be worked at a handsome profit; but with lead at 3.70 to 3.75 and silver at 85 or lower, the ore produced from the mines there pays little or no profit. Cook's Peek is the largest lead-producing camp in New Mexico, and if the miners there have to close down, the lead miners of New Mexico will not he so lond in the praise of the McKinley hill as some of them have been this year. Bullion is coming in on the stegee from Silver creek regnlarly from the Maud S mill. The Maud S is by far the largest producer in the Silver Creek district, and the property is being handled at a handsome profit. The company has a larger force of men at work than has ever heen employed before on the property, and from present indications the mill can be kept running steadily during the coming year. The mill has a capacity of about 35 tons of ore daily. The Silver City Water Company has had a snfficient supply of water for several weeks to furnish the Pacific m ll here, and the mill will he started up as soon as the vanners, which were taken out of the mill and taken to Pinos Altos lest summer, can be replaced.

CLIFTON.—Silver City *Enterprise*, Dec. 23: J. W. Fleming, who is back from Clifton, reports that the Clifton Company is now turning ont, on an averege, 11 tons of copper per day. About 200 tons of ore per day is taken out of the mines. The Church Company will soon resume operations at Morenci. The town of Clifton seems quite prosperous.

CARLISLE.—*Western Liberal*, Dec. 23: Pete McDermott was down from Carlisle this week with a shipment of 30 tons of high-grade ore, which he calculates will run over $100 per ton. His mine is still in bonanze; the last 40 feet of sinking took out ore worth $100 per foot. He has not done any stoping, all the ore he has taken ont being in developmeot work.

SOUTH DAKOTA.

FORTUNE'S LYING IN WAIT.—Deadwood *Pioneer*, Dec. 24. The history of the mining industry of the eerly days around us shows that the hills adjacent to Deadwood eastward have not had the development required to prove their exact value. Free-milling ore was the kind sought, and the refractory being predominant, the small mills, crude and ignorantly worked, failed to produce the results sought, and new fields southward being rushed, the regions of Spruce, Two Bit, Little Two Bit, Strawberry and other now well-known gulches, were nearly abandoned, and Bald Mountain, Ruby Basin, the Homestake mines, and other rich districts became the lodestones to prospectors and miners. The Strawberry mines, the Oro Fino group seem to be leading now in all reports. Beld Mountain and Ruby Besin hold their most valuable repntation and continue to produce rich rock. The Homestake mills reduce by their 2000 stamps their usual low-grade ore. Bnt laurels are not made simply for one section. Sometimes the seemingly deserted are the most conspicuous because the more brilliant, and capture them. Frequently, for reesons, one section is passed by for the elevation of another, but which, biding its time, comes out of the gloom of retirement, shining and beckoning and alluring. This seems to be the cese with the Spruce and Two Bit districts, where it is stated richer ores are than have yet been found anywhere except at Strawberry. Gold, silver and lead are the ores of these sections, and they appear in vertical veins of great width, in 30-foot stratas and thick blanket seams. Thousands of tons of rich, free-milling rock and also of refractory ore are said to he in sight in single claims. The value of such bodies of ore are well appreciated by all acquainted with the actual value of mines.

CONCENTRATES.—The J. R. mill was again sterted for a winter run by steampower with plenty of rich ore in sight to make the company rich. The old stations on Spruce creek will prove of immense value. Great faces of free-milling rock are reported uncovered, which have a low average of eight dollars. The Two Bit mines are reported to be very rich from late developments. A scheme is on foot to prove their exact value, and to investigate the statements that bodies of very rich ores have been uncovered. Foreman Bishop of the Oro Fino mine was in town, and expressed himself as more than well pleased with what the mine is doing. A strike of unusually rich ore is said to have been made in the old workings of the Blossom (formerly Lookout) mine. At last accounts the ore body was 60 feet wide. The mill is closed down for the winter, the flume having frozen np. Concentrators will be added during the winter. The Oro Fino is away ahead of itself up to date, if all reports are true. It is stated that no ore has yet beeu found to reach the value of some produced from below at these mines within the past week or ten days. "It is out of sight" for richness in gold, silver, and lead. We hope to be permitted to give detailed reports with reference to this bonenza spot. J. S. Childs, superintendent of the Harney Peak compeny, was in the city and reports matters as entirely satisfactory at Harney. The work is progressing as nsual and arrangements are heing made to begin shipping concentrates next month to Aurora, Illinois, or to New Jersey, the destination not having been definitely determined. Foreman Rossiter accompanied Mr. Childs to the city.

UTAH.

THE SAN JUAN COUNTRY.—Two well-known parties have returned to Flagstaff, A. T., from the San Juan plecer mines. George P. Thornton, formerly connected with Park City, Utah, mines, thinks there is gold there, but says it is not a poor man's camp. He and his associates located about 20 claims in a place which he thought could be worked the most economically of any there, and he calculates it will cost them $2000 to commence operations. The story of fabulous sums having been already taken out is a myth. Wm Babbitt, of the well-known firm of Babbitt Bros., the other party returning, while he does not claim to be a practical miner, thinke the reports have heen greatly exaggerated. There are three camps aloug the

river. The first is 25 miles from its mouth, where a syndicate of Winslow capitalists and Atlantic and Pacific Railroad officials hold about 400 claims. At this point there are about 200 men working, putting in machinery and tunneling to turn the river preparatory to mining. Twenty-five miles farther up is another camp of about 20 prospectors, and 50 miles farther up still another camp of prospectors, the latter being only 15 miles from Bluff City, Utah, where lumber and supplies can be had comparatively cheap. So far as can be ascertained, no golddust has been brought in as yet. Flagstaff is the most convenient point from which to reach the main camp, as there are plenty of conveyances to be had and the route from there is well supplied with water. A correspondent of an Arizona paper says: "Pay dirt is taken from the top, and at no place along the river to a point 50 miles above but from 15 to 20 colors can be taken from a pan. The location is an isolated one, and no communication can be had only by special messenger. In the meantime, people are flocking to the placers."

Market Reports.

Financial and Commercial Review.

SAN FRANCISCO, Dec. 29, 1892.

SILVER—Refined silver sold in New York, Thursday, at 82¼c and in London at 38¾c. News comes from Utah that owing to the continued low prices of silver and lead the Niagara group of mines, at Bingham, on which over $50,000 is invested, have been shut down, and the managers of the Old Jordan group have notified their men that they will have to accept a reduction in wages on January 1st or find themselves out of employment. A general reduction of miners' wages throughout Utah is threatened. In other parts of the coast mines have had to shut down, and it is difficult to dispose of silver properties.

QUICKSILVER.—There is no change to note in the regular prices.

BORAX—Prices continued the same as for some time past.

ANTIMONY.—Nothing of interest has developed in connection with this metal and prices are unchanged.

LEAD—Is firm at the low price of $3.85 per hundred for domestic.

TIN—The market is quiet; price for Straits is $19.50.

COPPER—The market remains steady and Lake is quoted at $12.30. Captain Thomas Couch manager of the Boston and Montana Mining and Smelting Company, in an interview stated that a major portion of the reduction of the ores of the company would be done at the works in Great Falls, Mont., as it could be done cheaper than elsewhere. He also stated that the copper mills of the company would probably not shut down in spite of the copper combine.

San Francisco Metal and Coal Market.

ANTIMONY.		**STEEL.**	
Per lb	— @ 13½	English, lb	— @ 18
BORAX.		Canton tool	— @ 8¼
Refined, in car lots	— @ 7½	Bl'k Diam'd tool	8½@ 15
Powdered, do	— @ 7½	Pick & Hammer	11@ 10
Concentrat'd, do	— @ 6¾	Machinery	4 @ 5
All grades jobbing at advance.		Toe Calk	— @ 4½
COPPER.		**TINPLATE.**	
Bolt	22 @ —	S. V. steel grade	
Sheathing	22 @ —	14x20, spot	— @ 5 87½
Ingot, jobbing	— @ 14½	Charcoal, 14x20	— @ 5 87½
Do, wholesale	— @ 13½	Do roofing, 14x20	— @ 5 87½
Fire Box Sheets	22 @ 24	Do, do, 20x28	— @11 75
IRON.		**PIG TIN.**	
Bar, base	— @ 3	Spot ℔ lb	— @ 24
Norway, base	— @ 4½	**COAL.**	
PIG IRON.	Spot.	**SPOT FROM YARD—PER TON.**	
Eglinton ℔ ton	20 00@— —	Wellington	$8 00
Glengarnock	21 00@ — —	Greta	7 50
Am. Soft, No. 1	22 00@ — —	Nanaimo	8 50
Oregon Pig	—@— —	Gilman	6 00
Puget Sound	20 00@— —	Seattle	6 50
Clay Lane White	22 00@ — —	Coos Bay	5 50
Langloan	22 50@ — —	Cannel	8 50
Thorncliffe	23 00@— —	Egg hard	12 00
Gartsherrie	23 00@— —	Cumberland, in sacks	15 50
Barrow	22 50@— —	Do, bulk	14 00
Cargofleck	22 00@— —	Wallsend	7 25
CHROME IRON ORE.		Scotch Splint	7 50
Per ton	10 00 @— —	Brymbo	7 50
LEAD.		West Hartley	7 50
Pig	— @ 4½	**TO LOAD—PER TON.**	
Bar	— @ 5½	Australian	6 25@— —
Sheet	— @ 7½	Liverpool Steam	6 37½@— —
Pipe	— @ 6¾	Scotch Splint	6 37½@— —
SHOT.		Cardiff	6 37½@— —
Drop, sizes *smaller* than B, ℔ bag of 25 lbs	$1 85	Lehigh Lump	15 00@— —
Do do, B and *larger* sizes ℔ bag of 25 lbs	2 10	Cumberland	13 00@— —
Buck, Balls and Chilled do, ℔ bag of 25 lbs	2 10	Egg hard	11 00@— —
QUICKSILVER.		West Hartley	7 25@— —
Home trade, pr. flask	$41 50 @42 00	**COKE.**	
For export	35 50 @36 00	English, to load	$8 50@ 9 50
		Do, spot, in bulk	—@ 9 50
		Do, in sacks	—@11 50
		Cumberland	9 00@— —

Eastern Silver Markets.

NEW YORK, Dec. 29.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.
Thursday	38¼	82½
Friday	38	82
Saturday	38	84
Monday	...	...
Tuesday	38	82
Wednesday	38¼	82½

Mining Share Market.

As usual, holiday time affected the stock market, which continues dull, with low prices. The fluctuations, such as they are, did not show any decided advance or decline until Thursday morning, when there was an advance under free purchases. At the 9:30 A. M session of the San Francisco Board, that day, the total sales were nearly 10,000 shares, the largest business of any session for quite a time past; and at the informal session which followed, the business continued large. During this revival, Consolidated California & Virginia and the neighboring north-end stocks were the most active features of speculation, but Potosi and the other middle stocks, and Belcher of the Gold Hill group, came in for a large share of attention. The market had a better tone than for several weeks.

Should the pumping association start active operations on the Comstock, and relieve the lower levels of water, there would doubtless be more interest in many stocks. There is a big hydraulic pump in the combination shaft of the Chollar, Potosi, Savage and Hale & Norcross Mining Companies, which, it is expected, will soon be in operation. The shaft in which this pump is located has a depth of 3300 feet, but it is filled to a depth of 1500 feet. Another large pump is located in the Union shaft belonging to the Sierra Nevada, Union and Mexican Companies. It is the object of the association to have the Fair, Sharon and Haywards factions pool their issues and relieve the mines of this vast body of water. There are excellent prospects in all the mines now under water, and particularly in the Belcher, Exchequer and Crown Point mines. Should this water be removed, and operations be begun, the stock market would decidedly improve.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F JOURNAL

ASSESSMENTS.

COMPANY AND LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T AND SALE.	SECRETARY
Alpha Cons M Co, Nevada	10	10c	Dec 29	Jan 24 Feb 14	C E Elliott, 309 Montgomery
Belle Isle M Co, Nev	5	10c	Nov 5	D o 7, Jan 4	J W Pew, 310 Pine
California Iron and Steel Co, California	7	20c	Nov 25	Dec 31, Jan 23	F Bonaudna, 428 California
Challenge Cons M Co, Nevada	13	2½c	Nov 30	Jan 4, Jan 25	C L McCoy, Mills Building
Chiton Con G M Co, California	1	50c	Nov 17	Dec 16, Jan 7	C E Gunn, Mills Building
Commonwealth Cons M Co, Nevada	10	10c	Nov 23	Dec 28, Jan 24	R R Grayson, 331 Pine
Confidence S M Co, Nev	12	75c	D c 21	Jan 26, Feb 15	A S Groth, 414 California
Cons California and Virginia M Co, Nevada	3	50c	Dec 13	Jan 21, Feb 16	A W Havens, 3 9 Montgomery
Con Imperial M Co, Nevada	34	3c	Nov 22	Dec 22, Jan 19	C L McCoy, Mills Building
Crown Point M Co., Nevada	50	25c	Dec 2	Jan 24, Feb 14	J Newlands, Mills Building
Del Monte M Co, Nevada	7	10c	Nov 22	Dec 27, Jan 24	J W Pew, 310 Pine
El Leopoldo G & S M Co, Mexico	1	10c	Nov 11	Dec 14, Jan 2	Jabez Howes, 130 Sansome
East Belcher M Co, Nevada	3	20c	Nov 23	Dec 29, Jan 18	C H Mason, 324½ Montgomery
Evening Star M Co, California	7	1c	Dec 6	Jan 12 Jan 31	J J So ville, 320 Sanrome
Gold Mountain M Co Cal	4	$2	Dec 21	Jan 28, Feb 15	J. F. Curtis, 325 Montgomery
Gould & Curry S M Co, Nevada	70	30c	Nov 22	Dec 28, Jan 20	A K Danbrow, 309 Montgomery
Indian Creek L & M Co, California	3	10c	Nov 4	Dec 14, Jan 3	S C Mills, Mills B'd'g
Martin White M Co, Nevada	28	2½c	Nov 28	Jan 16 Feb 2	K L Ross, 120 Sutter
North Belle Isle M Co, Nevada	21	10c	Nov 14	Dec 20, Jan 17	J W Pew, 310 Pine
North Gould & Curry M Co, Nevada	14	1 0	Nov 21	Dec 24, Jan 16	C H Mason, 324½ Montgomery
Russell Reduction & M Co, California	3	1c	Nov 11	Dec 19, Jan 16	J Morizin, 33 Geary
Sierra Nevada S M Co, Nev	103	25c	Nov 8	Dec 14, Jan 3	E L Parker, 309 Montgomery
Silver Lick Cons M Co, Nevada	3	2c	Nov 22	Jan 3, Jan 25	W Ladd, 531 California
Utah Cons M Co, Nevada	16	10c	Dec 13	Jan 19 Feb 9	A H Fish, 309 Montgomery
Yellow Jacket S M Co, Nevada	53	30c	Dec 8	Jan 10, Feb 14	W H Blanvelt, Gold Hill

MEETINGS.

COMPANY AND LOCATION.	MEETING.	SECRETARY AND OFFICE IN S. F.	DATE.
Argenta M Co, Nevada	Annual	R R Grayson, 331 Pine	Jan 9
Apollo Con M Co	Annual	L Closs, 310 San one	Jan 6
Bituuen Cons M Co, California	Annual	M P Doud, 240 Montgomery	Jan 10
Br nswick Con M Co, Cal	Annual	J Stadfeld Jr, 309 Montgomery	Jan 12
Bullion M Co, Nevada	Annual	R R Grayson, 331 Pine	Jan 12
Con. Bituminous Rock Co, Cal	Annual	F O Lewis, Phelan B ock	Jan 16
Consolidated Cal M Co	Annual	E Oliver, 22 Mint Ave	Jan 9
Pacific Coast Borax Co, California	Special	A H Clough, 103 Sansome	Feb 18
Shasta Iron Co, Cal	Annual	C B Morgan, 508 California	Jan 10
Silver King M Co, Arizona	Annual	J W Pew, 31 Pine	Jan 10

DIVIDENDS.

COMPANY AND LOCATION.	AMOUNT.	SECRETARY AND OFFICE IN S. F.	PAYABLE
Sulwer Cons M Co, California	5	L Cohen, 309 Montgomery	Oct 20
Champion M Co, California	10	T Wetzell, 310 Pine	Dec 19
Great Western Quicksilver M Co	25	A Halsey, 328 Montgomery	Oct 8
Mayflower Gravel M Co, California	25	D M Kent, 330 Pine	
Pacific Coast Borax Co., California	1 00	A H Clough, 230 Montgomery	Dec 10
Standard Cons M Co, California	10	J W Pew, 310 Pine	Dec 23

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DEC. 20, 1892.

488 431.—WRENCH—J. H. Gregory, Ione, Cal.

488,276.—STREET CAR FENDER—G. T. Hall, Monrovia, Cal.

488,434.—PISTON-ROD PACKING—J. B. Houston, S. F.

488,476—CAN-BODY-FORMING MACHINE—R. D. Hnne. S. F.

488,337.—NUT LOCK—S. A. Lake, Lakeview, Wasb.

488,524. — FEED-WATER HEATER — J. MacDonald, Los Angeles, Cal.

488,479.—PAINT—A. L. Munson, East Oakland, Cal.

488 248.—NON-HEAT-CONDUCTING COVERING—W. H. Norris, Spokane, Wasb.

488,483.—GAS ENGINE—J. W. Raymond, S. F.

488,232 — ANIMAL TRAP—O. S. Ward, Los Gatos, Cal.

488,411. — SLATE ATTACHMENT — Maud S. Wyman, S. F.

22,060.—DESIGN FOR SPOON—G. B. Stocking, Tacoma, Wash.

22 196.—TRADEMARK—M. E. Ogborn, S. F.

The following brief list by telegraph, for Dec. 27, will appear more complete on receipt of mail advices:

San Francisco—Caffran J. Hall, hydraulic elevator, Frank Lawrence, safety locks for gas cocks; Frank M. Ryan, car coupling; Allen E. Scott and J. W. Wright, billiard table; Josiah H. L. Tucker, Stockton, cable.

California—Dr. F. Oliver, Oakland lamp support; Edward Sempel, Alameda, batter cake mixture and depositor; Herbert L. Weitzel, Oakland, auxiliary steering gear.

Arizona—Joseph L. Giroux, Jerome, cable tramway.

Oregon—Samuel J. Galloway and G. P. Cramer, Plainview, car coupling; Clark Taber, Sumpter, water wheel.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CLIP FOR ROPEWAYS.—Bartlett McIntire, S. F., assignor to the Vulcan Iron Works. The invention is one of that class of clips designed for connecting load-carriers with endless traveling ropeways, in which the end of the body portion of the clip makes connection with the cable by entering between the strands. These ropeways are designed for the transportation of material from one point to another. The material is contained in suitable carriers or receptacles suspended by means of hangers from clips which are connected with the wire rope or cable of the way. These clips are made to connect with the cable in various ways. Some forms of clips were provided with flexible leaves connected with the body portion, and embracing and encircling the cable and clamped thereon. Other clips were made some to enter and some to pass through the cable between its strands. This new clip belongs, as before stated, to that class in which the end of the body portion of the clip enters between the strands of the cable; and it consists in a clip having the end of its body portion provided on its under surface with a groove, on its upper surface with a groove, both grooves being inclined or spirally directed, and its extremity beyond said grooves formed in a straight hook. The end of the clip enters the cable, its grooves partially embracing and conforming to the lay of adjacent strands, and its hook end partially embracing the soft core or heart of the cable. This clip can be readily and firmly connected with the cable of a wire ropeway.

CAN-BODY-FORMING MACHINE. — Robert D. Hnme, S. F, No. 488,476. Dated Dec. 20, 1892. This is an improvement in machines for forming sheet-metal can bodies. The object of the invention is to provide an improved means for closing lock seams which form the longitudinal junction of the meeting edges upon the side of a can-body. This mechanism may be applied to any can-body-forming machine in which a mandrel or horn is employed, around which the body is formed. The invention is designed simply to close the seam which is formed upon the can-body in any well-known machine already in use.

GAS ENGINE.—John W. Raymond, S. F. No. 488,483. Dated Dec. 20, 1892. The mechanism described in the patent enables the inventor to open the inlet and exhaust valves independently of each other by cams upon the single shaft in close proximity to the valve stems and the head of the ignition chamber, and adjustable springs will close the valves with a rapidity proportioned to their tension. This in the inlet valve may be made to act as a cut-off to regulate the amount of explosive gas admitted to the cylinder. By opening the inlet valve by direct pressure of a cam, the explosive gas is admitted freely and in larger quantity than when the valve is opened by the vacuum produced by the movement of the piston, and compression commences immediately when the piston begins its return stroke. The ignition chamber is shallow, and the inlet and outlet valves open directly into it, so that all the products of an explosion will be entirely expelled when the piston returns after the explosion has taken place.

ANTI-FOULING PAINT.—Anson L. Munson, East Oakland, assignor of one-half to Thos. G. McLeran, S. F. No. 488,479. Dated Dec. 20, 1892. This is one of that class of antifouling paints in which mercury is used. It is composed of a pigment, mercurous chloride and a vehicle consisting of coal tar, chloride of zinc and oil of turpentine in certain proportions.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco.

THE FRALEY ELECTRIC COMPANY. Capital stock, $1,000,000. Directors—J. P. Jackson, J. B. Fargo, J. Conch, Solon Pattee and George A. Bell.

MOKELUMNE RIVER MANUFACTURING COMPANY. Object, to manufacture lumber. Capital stock, $2,000,000. Directors—J. H. Logan, I. L. Thurber and F. L. French of Santa Cruz, and J. S. Storey and Frank Ashton of San Francisco.

THE EL DORADO LINSEED OIL COMPANY. Directors—Edward L. G. Steel of Oakland, John McKee, D. E. Colton, George A. Moore and Ed. Polhemus of San Francisco. Capital, $100,000.

THE WESTERN TRANSFER AND STORAGE COMPANY. Directors—S. R Church, F. H Belcher, George E. Maguire, Hallock Wright and Thos. Walters. Capital $1250, all subscribed.

THE LETHENT WATER AND LAND COMPANY. Directors—Wm. Strader of Coalenga, Fresno county, and George L. Brown, D. Gilbert Dexter, A. J. Robinson and G. B. Davidson of this city. Capital, $5,000,000.

Board Sales of Mining Stocks.

THURSDAY, Dec. 29, 18 2.

9:30 A. M. SESSION.

100 Andes	25c	450 Julia	5c
100 Alta	20c	300 Lady Washington	10c
100 Alpha	10c	50 Mexican	1 20
350 Bullion	80c	50	1 25
100 Belcher	1 55	500 Ophir	1 70
500 Best & B	1 25	500 Overman	35c
1680 Con. Cal. & Va	1 75	50 Potosi	1 80
100 Crown Point	65c	500 Savage	95c
550 Chollar	85c	100 Sierra Nevada	1 90
150 Gould & Curry	85c	20	1 00
200 Hale & Norcross	80c	100	1 25
300	85c	200 Union	1 00
200 Justice	25c	1 00 Yellow Jacket	50c

2:35 P. M. SESSION.

250 Andes	27c	100 Hale & Norcross	85c
200	30c	200 Lady Washington	10c
100 Sullion	85c	300 Mexican	1 25
300	80c	100	1 30
150 Best & B	1 30	300 Ophir	1 80
200	1 35	200	1 75
50 Belcher	1 50	200 Overman	35c
350	1 60	700 Potosi	1 85
400 Challenge	30c	150	1 80
300 Chollar	90c	100 Savage	1 00
300 Caledonia	15c	300 Sierra Nevada	1 30
415 Con. Cal. & Va	1 85	100	1 75
150	1 80	100 Union	1 05
100 Crown Point	55c	100 Utah	10c
25	60c	30 Yellow Jacket	45c
400 Exchequer	15c	50	50c
700 Gould & Curry	90c		

Our Agents.

J. C. HOAG—San Francisco.
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SAMUEL B. CLIFF—Creston, Cal.
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W. H. MURRAY—California.
E. H. SCHAEFFLE—El Dorado and Amador Co's.
C. E. ROSASTON—Hnmboldt Co.
CHAS. E. TOWNSEND—California.

Unitarian Literature

Sent free by the CHANNING AUXILIARY of the First Unitarian Church, cor. Geary and Franklin Sts., San Francisco. Address Miss S. A. Hobe, as above.

DIVIDEND NOTICE

GERMAN SAVINGS AND LOAN SOCIETY, 526 California Street. For the half year ending Dec. 31, 1892, a dividend has been declared at the rate of five and one-tenth (5 1-10) per cent per annum on Term Deposits, and four and one-quarter (4 1-4) per cent per annum on Ordinary Deposits, payable on and after Tuesday, Jan 3, 1893.

GEO. TOURNY, Secretary

DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION, 532 CALIFORNIA Street, corner Webb; Branch, 1700 Market Street, corner Polk.—For the half year ending with Dec. 31, 1892, a dividend has been declared at the rate of five and one-tenth (5 1-10) per cent. per annum on Term Deposits and four and one-fourth (4¼) per cent. per annum on Ordinary Deposits free of taxes, payable on and after TUESDAY, Jan. 3, 1892. LOVELL WHITE, Cashier.

WADE & WADE,
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